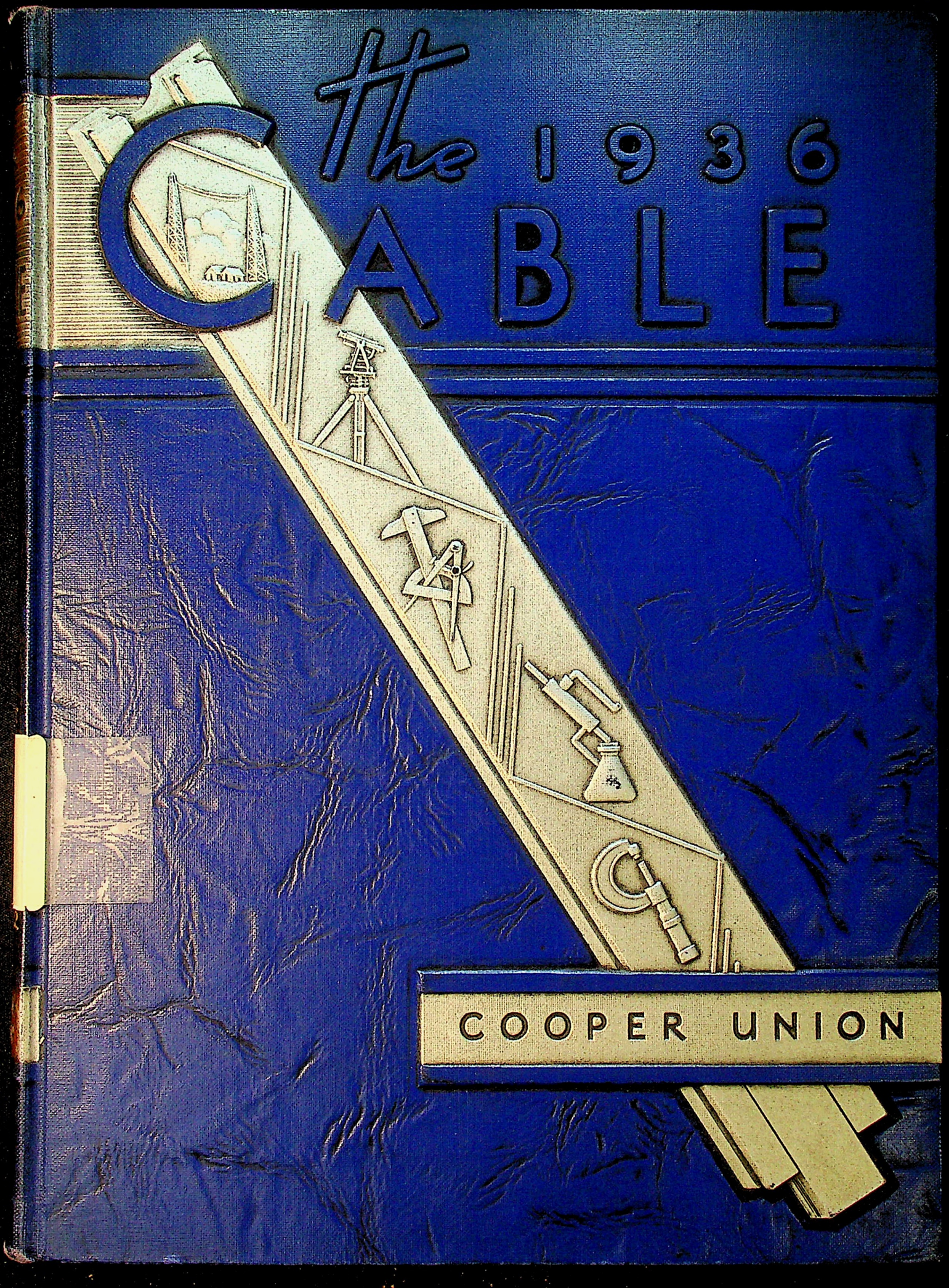
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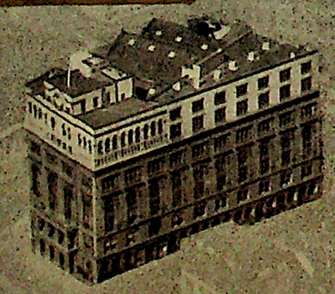

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Dedication

To WALTER S. GIFFORD, A.B., Harvard, trustee of The Cooper Union and one of its firmest friends; because since 1925, he has held the position of President of the American Telephone and Telegraph Company, one of the world's foremost engineering organizations; because he has been honored with an LL.D. from Williams and from Colgate, and a D.Sc. from Oberlin; because he is author of several books on current economic questions and for the last twenty-five years has served on many governmental committees; and because he is a Fellow of the American Association for the Advancement of Science.

Theme

We, the staff of the 1936 CABLE, have selected as our theme, "The Engineer in the Modern World." Within these pages we have endeavored to elevate the engineer to his rightful place in society and to glorify his work and achievements.

In keeping with this theme, and because of the great strides with which the field of photography has advanced in the past few years, we have employed this medium almost exclusively. Instead of the customary pictures we have used unusual camera tricks. Extraordinary shots from odd angles have been the keynote in the presentation of our subject.

A vivid, illustrative, photographic history—an absorbing panorama of present day technical progress . . . . .
THE THEME of THE 1936 CABLE!

THE SCHOOL

THE SCHOOLS OF COOPER UNION

The Cooper Union includes the following schools: Institute of Technology, Day Art School, Night School of Engineering, and Night School of Art. The tuition is free in all the schools—entrance being gained by competitive examination only.

The Institute of Technology gives to the students by day, intensive four year courses leading to degrees in the four fields of engineering.

The Day Art School aims to give in four year courses, a general education in the Fine Arts of Design to young men and women who expect to be dependent on their own exertions for gaining a livelihood.

The Night School of Engineering since 1932, offers six year courses, broadened considerably in scope as compared with the five year courses, and leading to degrees in the four major fields of engineering. The six year courses thus serve better to meet the demands of modern engineering.

The Night School of Art, which this year includes the Night School of Architecture, endeavors, through comprehensive courses in the Fine Arts of Design, to train the student to grasp and to solve problems intelligently, and to impart to him the practical knowledge necessary for starting work in his field.

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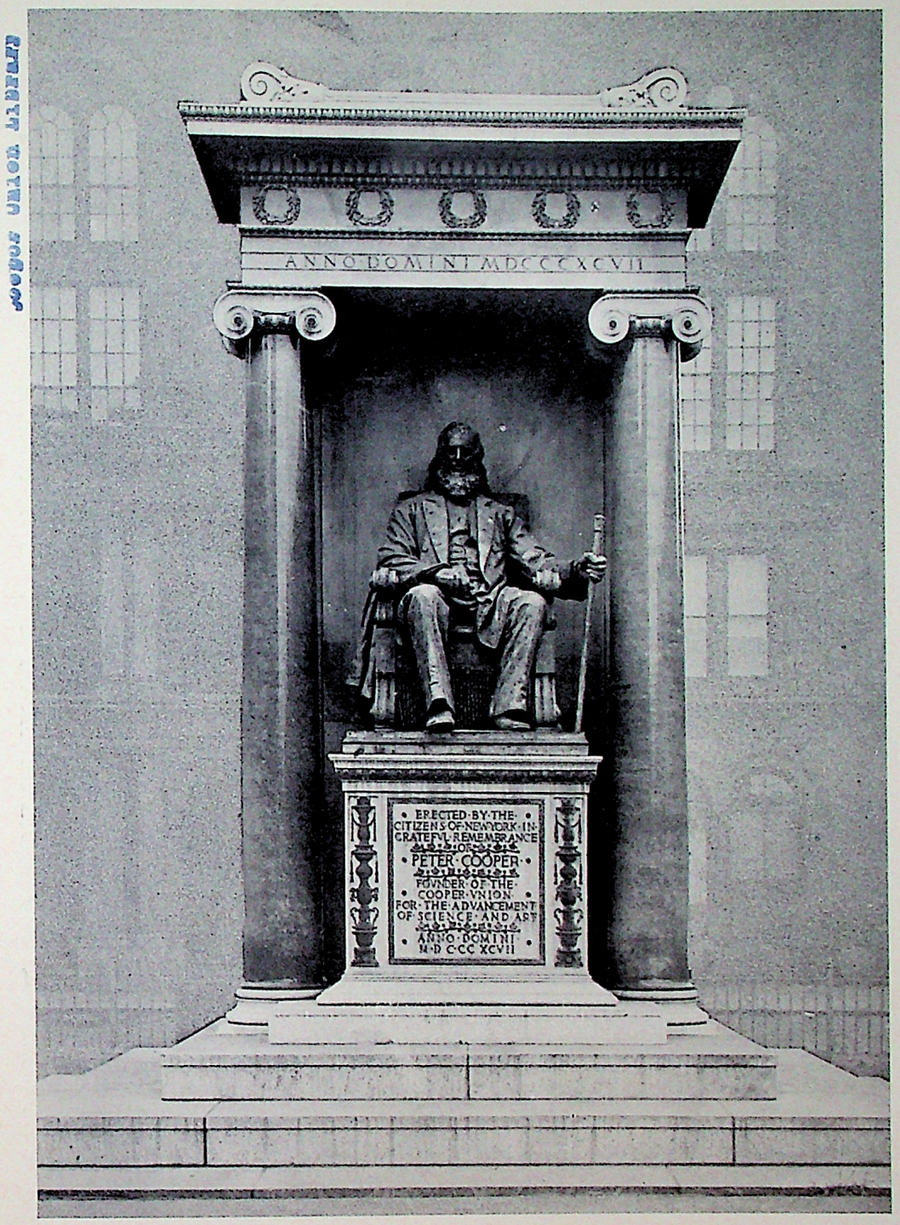

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THE SPONSORS

Because of the unusual interest of THE 1936 CABLE to all those connected with The Cooper Union, there are some who have seen fit to identify themselves more than others with the effort to attain the goal set by the Staff of THE 1936 CABLE. To the following men, we convey our heartfelt appreciation for the assistance which has aided materially in reaching this goal.

J. PIERPONT MORGAN, A.B., Harvard. Thrice honored with an LL.D., from Trinity College, Connecticut; Cambridge University, England; and Harvard; he has also been honored with a D.O.S. from New York University. He is head of J. P. Morgan and Company, director of United States Steel Company of New York, and of Aetna Insurance Company. A trustee of The Cooper Union since 1912, Mr. Morgan also serves in that capacity for the Metropolitan Museum of Art, the American Museum of Natural History, the New York Public Library, and the New York Trade School. His club memberships include the Metropolitan, Century, Knickerbocker, University, Harvard, Union, and Racquet and Tennis Clubs.

ELIHU ROOT, Jr., A.B., A.M., Hamilton College. Honored with an LL.B., Harvard, he is a member of the firm of Root, Clark, and Buckner. Mr. Root's directorships include: American Smelting and Refining Company, Mutual Life Insurance Company, All American Cables, Judiciary Trust Company, Teachers Insurance and Annuity Association. He served as Major, 307th Infantry, A.E.F. Trustee of The Cooper Union since 1929, and also of Hamilton College and the Metropolitan Museum of Art, Mr. Root is a member of the American Bar Association (New York State and City). He is a member of the Phi Beta Kappa honorary scholastic fraternity and of Sigma Phi, and of the University, Harvard, Century, and Knickerbocker Clubs.

BARKLIE HENRY, A.B., Harvard. Mr. Henry is a director of the United States Trust Company of New York, Blue Ribbon Books Incorporated, and Reynal and Hitchcock, Publishers. He is also a director of the Milbank Memorial Fund and President of the New York Association for Improving the Condition of the Poor. Mr. Henry is a member of the Board of Governors of the New York Hospital, of Bloomingdale Hospital and the Council of New York University. He is a trustee of The Cooper Union since January, 1935, of St. George's School, Newport, Rhode Island, and the Green Vale School in Roslyn, Long Island. His club memberships include the Harvard, Knickerbocker, and Century Clubs of New York.

PERCY R. PYNE, Jr., A.B., M.A., New College. Mr. Pyne began his college career at Princeton University but his studies were interrupted by the World War. He served with the 103rd Squadron in France and received the Distinguished Service Cross. After the War he completed his college studies at New College, Oxford, England, from which institution Mr. Pyne holds his A.B. and M.A. degrees. After graduating from New College, he pursued further studies at Cambridge in Archaeology and Ethnology. Mr. Pyne has been Treasurer of The Cooper Union since 1925. He is a member of the Princeton and University Clubs of New York City, and takes an active part in many charitable and philanthropic undertakings.

HENRY D. WILLIAMS, B.S. and M.E., Cooper Union. Leaving The Cooper Union, Mr. Williams attended Columbia University Law School where he received his LL.B. He is senior partner of Williams, Rich and Morse, patent, trademark, and copyright law attorneys. Vice-president of the American Patent Law Association, he is also a member of the American Bar Association (New York State, New York County, and New York City). Mr. Williams is numbered among the members of the Academy of Political Science, the American Museum of Natural History, the Metropolitan Museum of Art, the Sons of the Revolution, and the American Red Cross. Mr. Williams is one of the nation's foremost lawyers, specializing in patent law.

ROBERT W. KALTENBACH, B.S. and C.E., Cooper Union. Since graduation from The Cooper Union, Mr. Kaltenbach has followed strictly engineering work. Organizing his own firm of consulting engineers in 1897, developing rapidly, and reorganizing into the Interstate Engineering Company, he became executive vice-president of the McMyler Interstate Company. Since 1929, he has been president of the R. W. Kaltenbach Corporation, specialists in large equipment handling. Mr. Kaltenbach holds the professional titles of Civil and Mechanical Engineer under Ohio State Law. He is a member of the Cleveland Engineering Society, American Steel and Iron Institute, the Union Club of Cleveland, and the Congressional Club.

Tribute

Engineers are men, like you and I,
Whose works on earth will never die.
They are chosen and so endowed,
That Mother Nature might be proud
To say, "Well done, my sons, your work
Has made life better here!"

Scant praise is sung for those who hope
To give this life a broader scope.
But do not fear to forge ahead
That you may say before you're dead,
"I did my part and did not shirk,
I am an Engineer!"

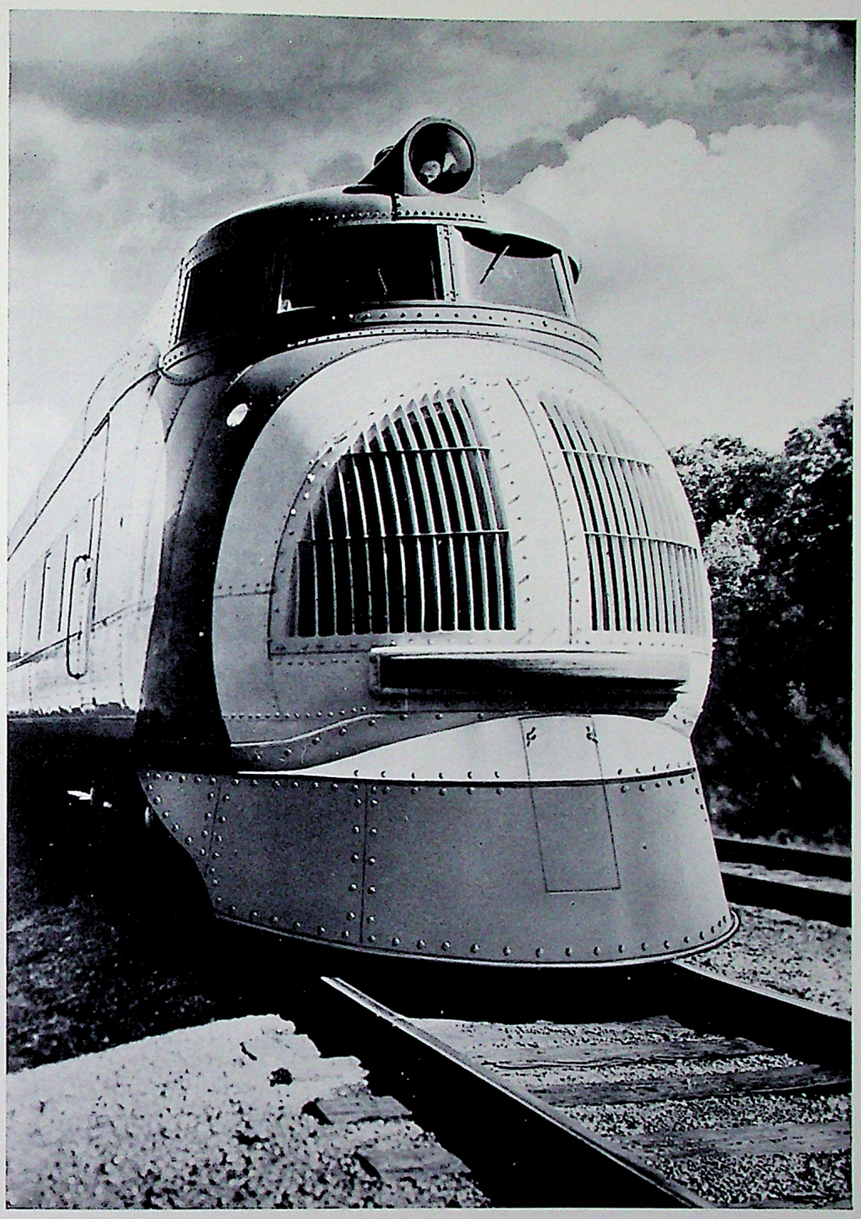
MECHANICAL ENGINEERING

THE advancement of civilization, the enlarged scope of industry, the increase of travel, the development of cities—all these have tested the skill and ingenuity of the mechanical engineer, and he has not been found wanting. Research, laboratory work, theoretical study have their unquestioned value. Important progressive results, however, are attained only by determined and untiring application. Invention, discovery, and improvement in the field of mechanical engineering have kept pace with the modern demand for safety of travel, speed of transportation, concentration of space, comforts of living. The railways, automobiles, airplanes have had remarkable developments in recent years. Problems of heating, refrigeration, air-conditioning, steam boilers, have been solved by the mechanical engineer.

A survey of the work in railroad development, alone, is indicative of the importance of the mechanical engineer today. High points in engineering progress during the last few years have been: air-conditioning on railroads; pre-cooling of cars on railroads; the application of "rubber heels" at all points of metal contact on trucks and underframes of passenger cars; the construction and inauguration of high speed, streamlined steam locomotives; the inauguration of streamlined trains; first laboratory test of 3600 horse-power Diesel electric engine; the use of the most powerful Diesel electric engine, 1800 horsepower unit, for use on light weight high speed trains.

These last two developments are most significant. The twin unit diesel-electric engine built for test service on American railroads, in 1935, made a remarkable run of one thousand one hundred and fourteen miles. This was believed to be the longest run ever made by a heavy Diesel-powered train of standard all-steel Pullman equipment, without change of engine, and stopping only for refueling and for the purpose of discharging and embarking passengers. This engine is the most powerful of its type yet placed in road service in this country. It consists of two eighteen hundred horsepower units of exactly the same construction, either one of which can be used on lighter trains. When operated together the two units are handled by one engineer, who has absolute control of both units.

Earlier, in 1934, the advent of a lightweight streamline train of stainless steel equipped with a six hundred and sixty horsepower two-cycle Winton Diesel engine pointed an important trend in railway growth. This train represented an effort to get as far away as possible from the traditions and conventions that usually surround the design and construction of railway equipment. Subject only to such limitations as track gauge and outside clearance dimensions, the objectives set out were



comfort, speed, economical operation, and beauty and suitability of line and color both in exterior and interior treatment, with constant emphasis on safety. It is interesting to note that despite the trend toward electrified power, the steam locomotive is not losing its place as an important motive power on the railways. The improvements that have been made in steam locomotives are as outstanding as those in other directions and the performance of the latest types justifies the opinion that they are still secure in the major field of railway operation.

Excerpts from current advertising of railroad companies show that even the most scientific improvements are of interest to the layman. The public reads in one: "The exterior is painted a golden brown, top and bottom, with sides and rounded nose of canary yellow—a color selected because it can easily be seen at great distances. The low center of gravity, the elevated cab with its dual controls, the dual fog-penetrating headlights, the increased visibility of the exterior color; a braking system, especially designed to insure utmost safety at high speeds, are outstanding features of the train."

The course of railroad history as affected by the work of the mechanical engineer is similar in import to advancement in other fields of travel and transportation. The use of the automobile is today within reach and often a necessity for the out-of-the-way farmer, the small town business man. Such widespread use of this conveyance presented the problem to the engineer of reducing cost while improving cars as to speed, compactness, etc. The accomplishments in this field are easily recognizable on any city street or country road. The interest shown in the annual models of automobiles is sufficient testimony to the quick awakening of the public to the beauty in a modern machine. The new standards reject all design for decoration's sake. They rely entirely on the careful study of the strictly useful elements of the design, fusing them, so to speak, into a whole without any unnecessary features.

The engineer has shown his artistic hand, as it were, in streamlining. Streamlining is a fashion, it is true, but it is based on utility. There is no doubt that the style appeals to the public, for it expresses the prevalent vogue for speed. The quest for speed creates the urge to eliminate all possible wind resistance. This affords the scientific basis for the style and accounts for the appearance of the streamline effects in the new models of automobiles, concurrently with the great increase in their capacity for speed.

Man, long ago, proved his unwillingness to keep his feet on the ground no matter what the speed. Thoughts of air-travel are found in writings many centuries back. Today air-travel is not merely an idea; it

is an established reality. It is an everyday occurrence for a man to leave his office in New York City after lunch and meet an associate for dinner in Chicago. Times Square to the Loop in five and three-quarter hours! With the aeroplane in constant use for business and pleasure travel, the engineer has found it necessary to look to more than the basic construction of the plane. It has been his problem to work on details which bring this means of conveyance within the scope of the ordinary rather than the unusual mode of traffic. Questions of speed, of safe landings, of size, have required comprehensive study.

Not very many years ago, an air flight was considered an adventure, a daring feat. Today, an air-minded public is familiar with such terms as wing flaps, balancing tabs, wheel cuffs, assist loops. Recently manufactured planes offer notable perfection in design and construction from the standpoint of utility and beauty at prices which are relatively very low. Today we can truly believe it is "easy to fly."

This generation owes a debt of gratitude to the mechanical engineer. He has given it ten league boots, he has helped it to soar to the clouds. We think of him as a scientific, practical figure. He is also a romantic one. His work requires foresight, vision, self-sacrifice. He must be willing and able to see the future.

Modern engineering has given new values to time and space. Distances have been shortened, time has been increased for us. Executives of business organizations can visit branches from Gotham to the Golden Gate within a week. Lives are daily saved because special serums or other medicinal services can be brought to out of the way places at incredible speed.

The engineer has outwitted even the weather man. In the middle of a sweltering August day in a hot city, it is unnecessary to travel many miles for cooling relief. Entrance into almost any theater provides a mild, cool temperature made possible by the mechanical engineer's work in air-cooling and air-conditioning.

With such provision for our speed and safety of travel and transportation, for our comfort, for our pleasure, it would seem as if the mechanical engineer could sit back, crowned with a laurel wreath, to view his wonderful work with pride. But even if we are satisfied, he is not. The clouds are not high enough for him. He will go further. We have read of occasional attempts at stratospheric flights. This is the problem the mechanical engineer has undertaken. He will solve it. He has made slow, tedious travel a thing of the past; he will make stratospheric investigation a possibility for the future. He has vision. Let us have faith in his vision.

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As fine a man as you could ever expect to meet. The students know him well and often seek his advice and counsel to carry them over the rougher places. Dean Bateman himself has frequently said, "My happiest moments are those spent in advisory service with the many students who, due to various adverse circumstances, find themselves in difficulties, scholastic or otherwise." Helpful, fatherly, cheerful—giving himself unstintingly to the welfare of The Cooper Union and its students, he has displayed those sterling qualities common to that band of men who have given to The Cooper Union its meritorious scholastic reputation.

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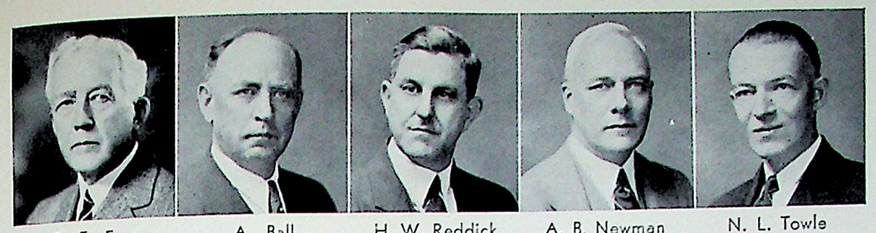

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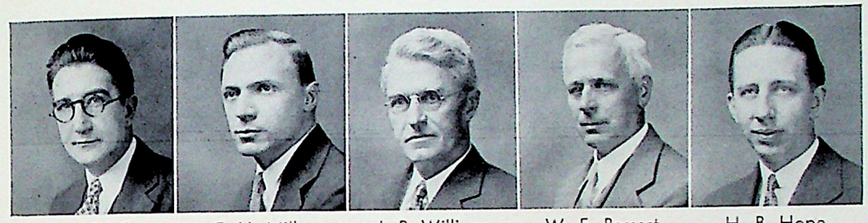

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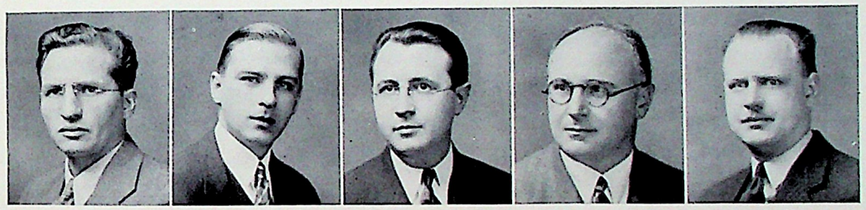

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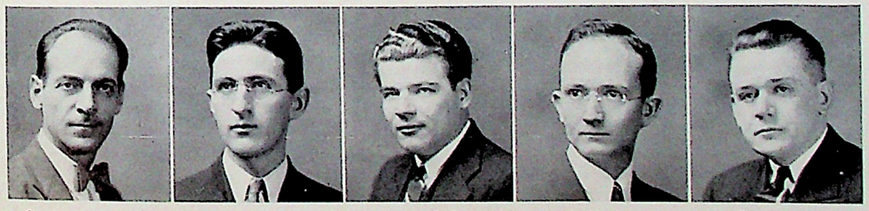

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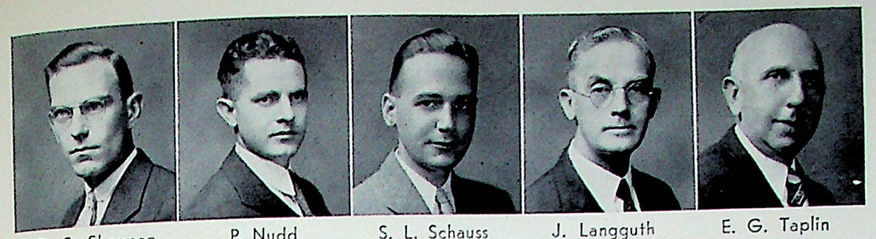
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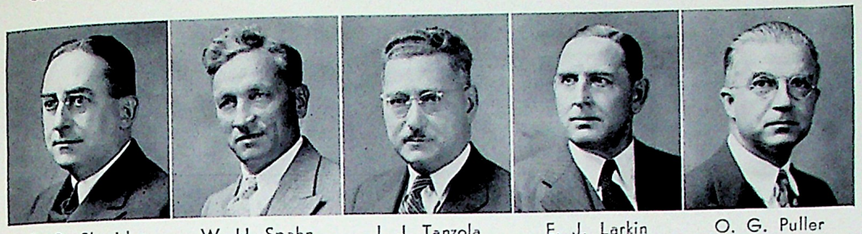
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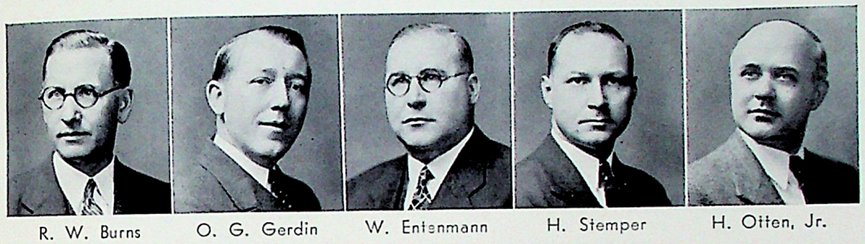
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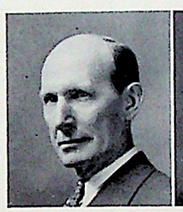

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C. B. Heller

R. S. Hutchins

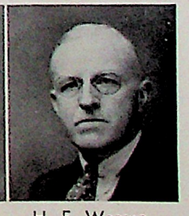
C. Rudy

B. Rabenold

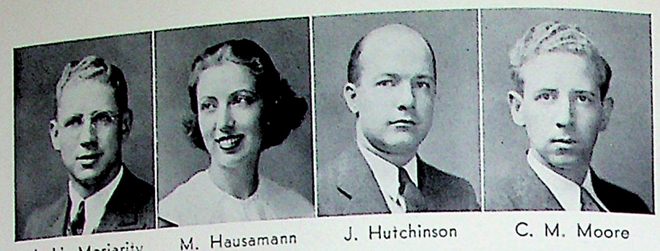
H. Schutz

A. Stenbery

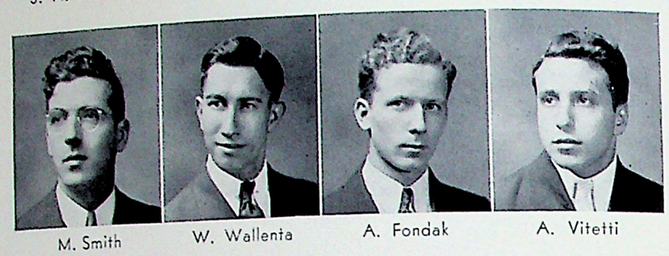
B. Thomas



H. E. Warren



J. H. Moriarity M. Hausamann J. Hutchinson C. M. Moore



M. Smith W. Wallenta A. Fondak A. Vitetti

THE LIBRARY

Many thanks are due to the members of the staff of the library, headed by John H. Moriarity and Margaret E. Hausamann, from numerous students of both engineering and art schools. It is to their earnest, sympathetic, and efficient co-operation that a great number of us owe our scholastic success at The Cooper Union.

THE ADMINISTRATIVE ASSISTANTS

It is a well known fact that no college course, however carefully planned is ever unhampered by obstacles. Consequently, much unheralded and ofttimes unnoticed assistance behind the scenes is necessary. To the various laboratory assistants, mechanicians, secretaries, and clerks, the smooth, unbroken tenor ot The Cooper Union must be credited.

H. Golle E. Cannon D. Stringer P. Cronon N. Fallenburg J. J. Cowdery

CIVIL ENGINEERING

IN 1898, men gazed with wonder at and spoke in hushed tones of the Brooklyn Bridge. Today this pales in significance beside tremendous projects like the George Washington Bridge, Boulder Dam and the TVA development. Current social and economic problems have presented a challenge to the civil engineer, a challenge he has met nobly.

Bridges, tunnels, dams, highways, irrigation systems all over the United States are permanent monuments to the scope and strength of the civil engineer's work. The civil engineer does not fight nature; in recent years he has learned how to control and utilize her. Engineering has made it possible to span wide areas of water, to divert water, to control it, to harness it.

One government project alone, the Boulder Canyon Project, is an undertaking that will mark an epoch in the history of the great engineering achievements of the world. For over sixteen years the Bureau of Reclamation of the United States Department of the Interior worked on the perfection of a plan whereby the periodic ravages of the temperamental Colorado River might be eliminated and its power diverted to useful ends. Finally the following plan was developed: First—the construction of a dam, in one of the canyons of the Colorado River, large enough to control the flow of water at all times, to provide flood storage, to store water for irrigation and domestic use, and to serve as a settling basin for mud and silt. Second—the excavation of the All-American Canal, to conduct, for irrigation purposes, water from the Colorado at a point above Yuma, Arizona, to the farm lands in south-eastern California. Third—the construction of a power plant, immediately below the dam, to generate electrical energy, the sale of which would make the entire project self-liquidating.

When work was started on Boulder Dam, the United States launched the largest government project since the Panama Canal. Boulder Dam will be the world's highest concrete structure, and the highest and largest dam ever constructed. It is to be the arch-gravity type, 45 feet thick at the top, 650 feet thick at the base, and will rise about 730 feet above the foundation rock. Its length along the top will be 1180 feet. The dam proper will contain about 3,400,000 cubic yards of concrete masonry, and 1,000,000 cubic yards more will be used in constructing the power house and related structures. The total quantity of concrete, 4,400,000 cubic yards, would be sufficient to build a standard paved highway 16 feet wide from Miami, Florida, to Seattle, Washington. The engineering and construction problems that must be solved in building a dam of this size are of a magnitude and complexity that are difficult to realize.

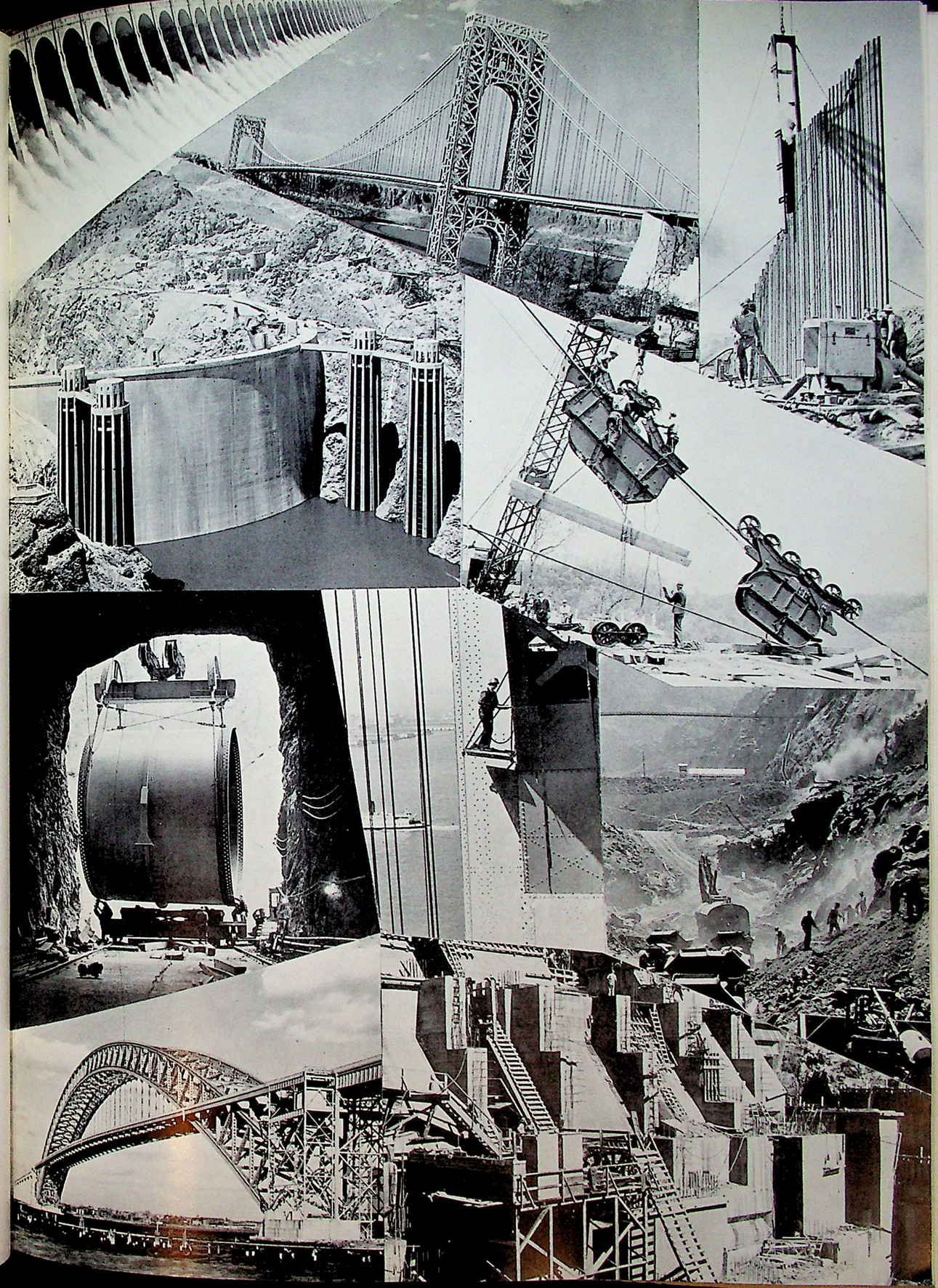
In this project we see the interrelation of the various branches of engineering; in this instance, the department of civil, mechanical, and electrical engineering. All engineers are more or less familiar with the basic construction and hydraulic problems of the Boulder Dam project. Not so many appreciate the larger benefits incidental to this great work, including not only the immediate and varied water services, but also the attendant economic and recreational values.

This is an epic project, the far reaching effects of which in engineering economics and social development we are yet to witness. Another project equal in boldness and magnitude is the Tennessee Valley Authority development.

Two particularly interesting engineering accomplishments of the project are Wilson Dam and Pickwick Landing. Begun during the World War and left virtually idle until the establishment of the TVA, Wilson Dam is nearly a mile long, 107 feet high, and 101 feet thick at the base. It has fifty-eight 38-foot spillways each capable of passing 10,000 cubic feet of water per second. The power plant consists of nine generators with a total capacity of 261,500 horsepower and space available for additional equipment to bring the total up to 613,000 horsepower. It is the source of TVA electricity today.

Eight miles upstream from Shiloh Battlefield, Tennessee, and 53 miles below Wilson Dam, is the site of Pickwick Landing Dam. Its construction was authorized on November 21, 1934 as the next link in the chain. It will be almost a mile and a half long (7,710 feet) and 103 feet high and will have a navigation lock 600 feet long by 110 feet wide with a lift of 61 feet, the greatest single lift in the world. The waters above the dam will back up to the foot of Wilson Dam which means that when Norris, Wheeler, and Pickwick are in operation there will be a 7-foot navigation channel from the mouth of the Tennessee at Paducah, Kentucky, to Pickwick Landing and a 9-foot channel from there to Guntersville, Alabama, a total distance of 358 miles. The dam will also aid in reducing the crest of flood waters. While no power facilities will be installed at first, the dam will be constructed with intake pipes permitting the addition of a power house later. The dam is expected to be completed in 1937.

Uncontrolled, running water means floods, destruction of the soil, loss of human life. Controlled running water means security, comfort, convenience. The civil engineer has studied and worked with running water so that he knows how to apply the controls. Boulder Dam and the development in the Tennessee Valley are two marvels of application.



The civil engineer has not only shown how to control water but how to span it. The last decade has seen the construction of bridges the length and width of which are almost incredible. The George Washington Bridge over the Hudson River, connecting 179th Street, New York City and Fort Lee, New Jersey, is the longest suspension span in the world. It took four and one-half years to construct. At present the bridge is a single deck structure consisting of four roadway lanes and two pedestrian sidewalks. Additional roadway lanes and a lower deck, intended for rapid transit service, can be added to meet future requirements.

The San Francisco-Oakland Bay Bridge, now under construction, will be the largest bridge in the world. It will span the San Francisco Bay, the largest major navigable body of water yet bridged. The Bridge proper will be 23,000 feet long. Its piers establish new engineering records for the depth below water and for the speed and volume of the pouring of concrete. The development of this structure has received widespread public interest and community cooperation. The people of California have followed with gratification the construction of catwalks and the spinning of cables. One of the most interesting features of bridge building is the months of preliminary work and mathematical calculations that precede the work in the field.

Closely associated with the construction of bridges is the building of tunnels. Familiar to us is the world's busiest vehicular tunnel, the Holland Tunnel, which providing a direct route between New Jersey and lower Manhattan, consists of two tubes, one for eastbound and one for westbound traffic, each two lanes wide. Another notable tunnel is the New York City water tunnel, the largest and deepest water tunnel in the world, extending twenty miles from Yonkers Reservoir to the Red Hook section of Brooklyn at an average depth of 600 feet. 1938 will see the opening of the Midtown Hudson Tunnel for traffic between Midtown New York and Weehawken, New Jersey.

Over water, under water, on land, the civil engineer has spectacular achievement to his credit. Increasing automobile travel has necessitated new developments in highways—in materials, in width, in curving and grading, the civil engineer has met and surpassed the numerous and intricate demands placed on him by the stress of economic, industrial, and social trends of the times. He is not content to span the waterways with bridges; he is prepared to span the land to make room for fast, long-stretch travel and commerce. The Pulaski Skyway in New Jersey is merely a hint of the sky roadways, the super-highways that the civil engineer envisions for the not too far off future!

SENIORS

TO THE SENIORS

A few years ago, you entered the hallowed halls of The Cooper Union—young, hopeful, ambitious. Many of you fell in the arduous struggle—some never to rise, others to fight again to the top. The few of you who remain, who are being graduated to the fulfillment of your hopes and plans, have the makings of success already within your grasp.

The Bachelor of Science degree given to you by The Cooper Union is an honor of which you can be justly proud. This recognition of your scholastic excellence ranks with those of the largest engineering colleges in the world. Treasure it! Boast of it! Remember, always, the man who made this possible. Remember the ideals of Peter Cooper! Keep them alive, keep them before you as your guide and model. But—the work of Peter Cooper is not yet finished. It is your duty as members of the Alumni Associations to help in its completion.

Peter Cooper once said, "I have always tried to do the best I know how." With your graduation from The Cooper Union, you must know how. All that remains for you is to go out and do your best.

JOHN A. ABBATE

Architecture — **Central High School**

HERBERT ADLER

Electrical Engineering — **City College**

Member American Institute of Electrical Engineers.

NICHOLAS C. APOSTOLOU

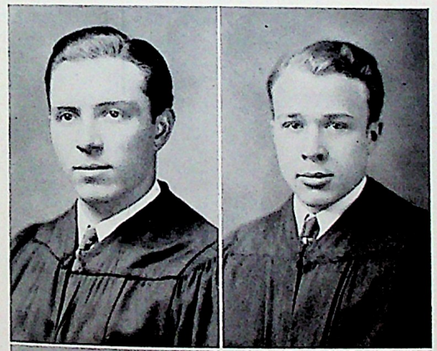
ΛΣΚ

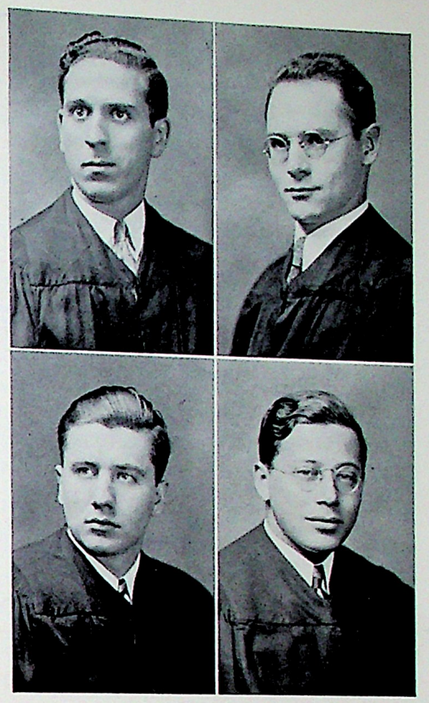
Architecture — **Brooklyn Technical High School**

Section Treasurer '33, Architectural Business Manager 1935 Cable, Senior Hop Committee '36.

DAVID ARONSON

Chemical Engineering — **New York University**





MICHAEL ARUCK

ΦΣΩ

Electrical Engineering — **Crosby High School, Conn.**

Member American Institute of Electrical Engineers, Track 1 year, Football 3 years, Athletic Association Treasurer '35, Athletic Association President '36.

SAM AUERBACH

Architecture — **Thomas Jefferson High School**

MAX AXELROD

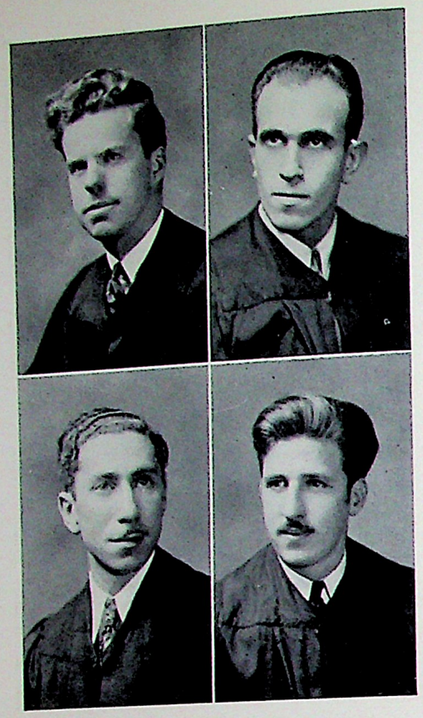
Chemical Engineering — **Boy's High School**

Basketball 2 years, Glee Club, Member American Institute of Chemical Engineers, Mathematics Club.

FREDERICK W. BAPTISTA

Civil Engineering — **DeWitt Clinton High School**

Treasurer American Society of Civil Engineers '35, President American Society of Civil Engineers '36.



GEORGE BENDA

Chemical Engineering **Bushwick High School**

STANLEY E. BERG

ΦΣΩ

Electrical Engineering **Thomas Jefferson H. S.**

Member American Institute of Electrical Engineers, American Institute of Banking.

RALPH J. BERGMAN

Chemical Engineering **James Monroe High School**

Junior Prom Committee '35, Senior Hop Committee '36, Pioneer 2 years.

ABRAHAM BERLIN

Mechanical Engineering **Brooklyn Technical H. S.**

ANDREW BARRY

Mechanical Engineering **Harrison High School**

Mathematics Club, Secretary American Society of Mechanical Engineers '34.

H. CARL BAUMAN

Electrical Engineering **DeWitt Clinton High School**

CHARLES S. BEGELMAN

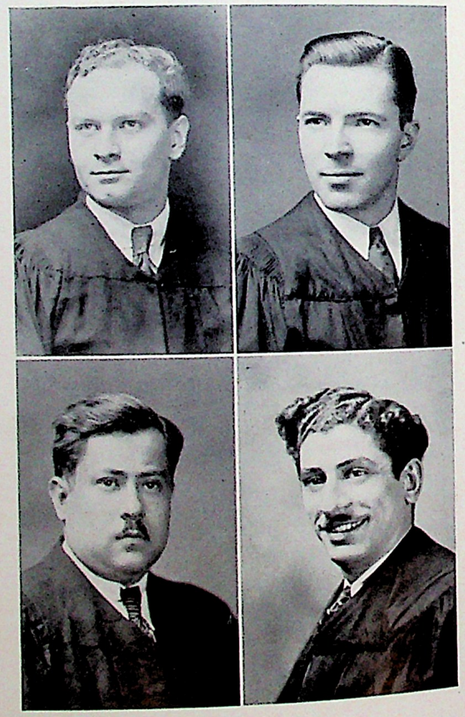
ΑΜΣ

Mechanical Engineering **East. Dist. Evening H. S.**

Class President '33, Junior Prom Committee '33, Mathematics Club, Member American Society of Mechanical Engineers.

FERDINAND BELLO

Architecture **City College**



IRVING BLACK

Civil Engineering **Brooklyn Polytechnic Institute**

Member American Society of Civil Engineers, Mathematics Club.

FRANK BLAHA, Jr.

Architecture **Mechanics Institute**

Section President '34, Section Treasurer '36, Member Student Council '34.

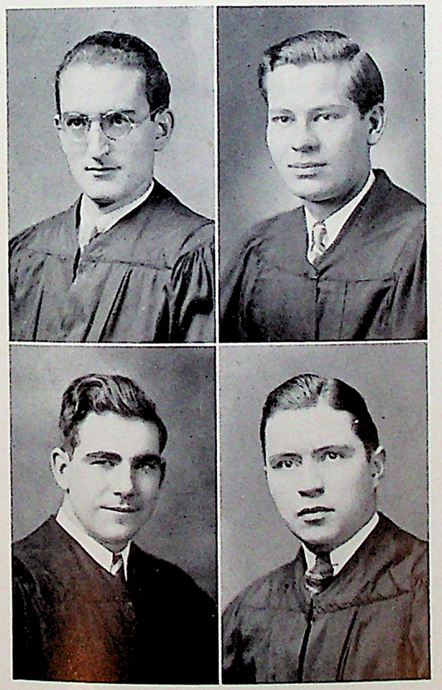
EDWARD J. BLASS

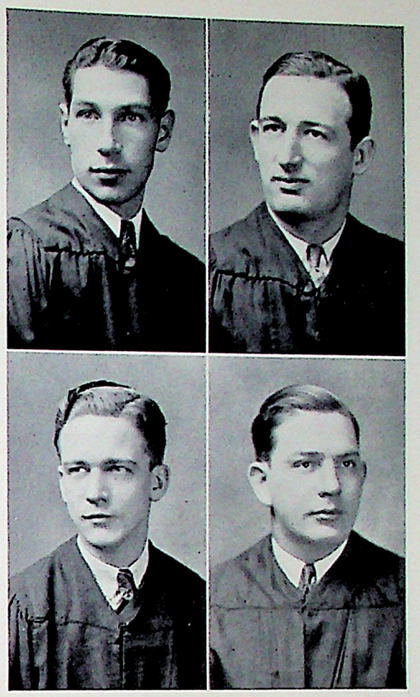
Civil Engineering **Pratt Institute**

LESLIE W. BOLLMAN

Civil Engineering **Mechanics Institute**

Class Secretary '33, Class Vice-president '34, Member American Society of Civil Engineers.





STEPHEN BOROSS

Chemical Engineering **Cass Tech. H. S., Detroit**

Night Circulation Pioneer '36.

ANGELO BOTTA

Mechanical Engineering **Stuyvesant High School**

Member American Society of Mechanical Engineers.

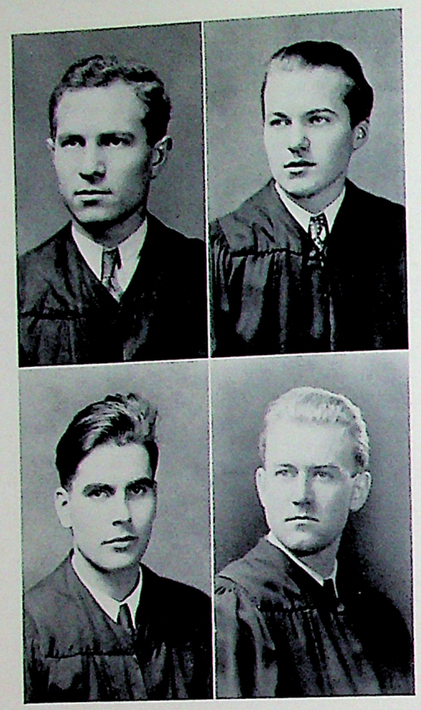
EDWARD BRADY

Architecture **Brooklyn Technical High School**

JAMES J. BURKE

ΦΣΩ

Electrical Engineering **St. John's University**



LOUIS CANTOR

Architecture — **New Lots Evening High School**

JOSEPH JAMES CAPO

Mechanical Engineering — **Regis High School**

LOVELL FRANK CARDENAS

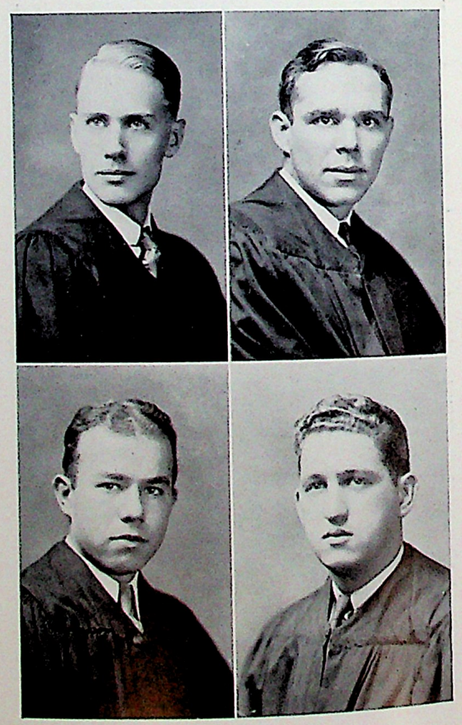
Electrical Engineering — **Ocean Grove H. S., N. J.**

Treasurer American Institute of Electrical Engineers '35, Mathematics Club.

STEN A. CASPERSSON

Civil Engineering — **Erasmus Hall High School**

Member American Society of Civil Engineers.



JOHN ALLAN CASSELL

Civil Engineering — **Brooklyn Technical High School**

VICTOR E. CATALDO

Electrical Engineering — **Guayama High School**

Member American Society of Electrical Engineers.

LOUIS CESALETTI

Chemical Engineering — **Clifton H. S., N. J.**

Member American Institute of Chemical Engineers, Mathematics Club.

MURRAY CHARLESTON

Architecture — **Hebrew Technical Institute**

Sect. Vice-president '36.

HYMAN I. COHEN

Civil Engineering — **City College**

Member American Society of Civil Engineers.

SAMUEL COHEN

ΑΜΣ

Civil Engineering — **Classical H. S., Worcester**

Member American Society of Civil Engineers, Basketball '33, Basketball Manager '33.

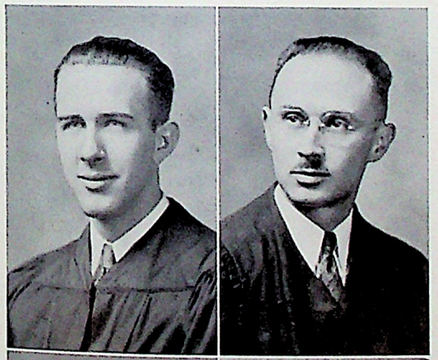
IRWIN M. COLEMAN

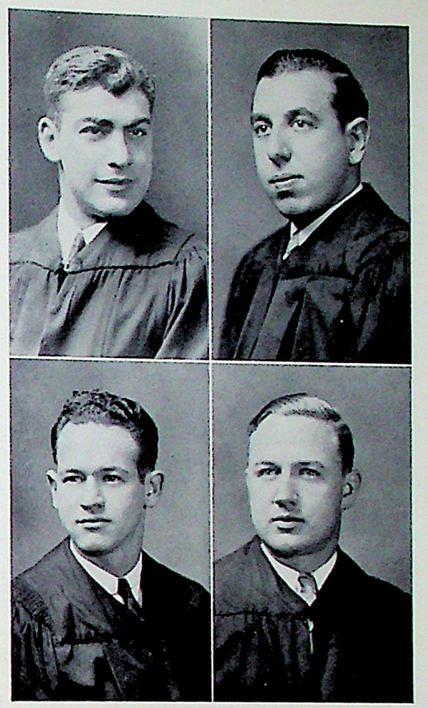
Electrical Engineering — **Townsend Harris H. S.**

Member American Society of Electrical Engineers.

LAWRENCE B. COONAN

Civil Engineering — **Pratt Institute**





GEORGE T. COOPER

Chemical Engineering — **Lincoln H. S., Jersey City**

Member American Institute of Chemical Engineers, Glee Club, Mathematics Club.

MORRIS COOPER

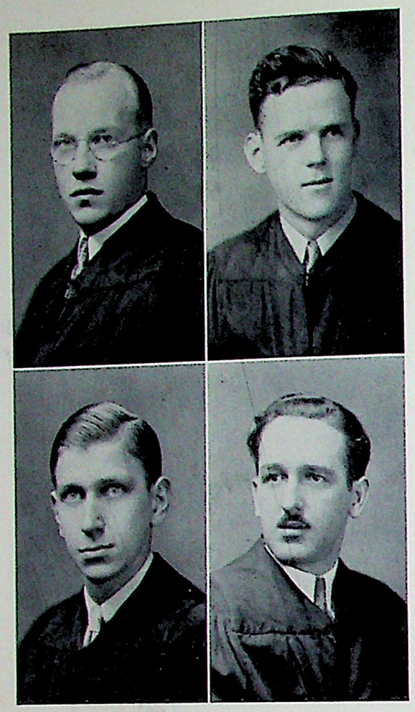
Chemical Engineering — **University Prep. School**

ALFRED G. CORUZZI

Architecture — **Stuyvesant High School**

HERCULES CUTTICA

Electrical Engineering — **Stuyvesant High School**



JOSEPH J. DeMAIO

Mechanical Engineering **Stuyvesant High School**

Member American Society of Mechanical Engineers.

BERNARD DI PAOLO

Architecture **Paterson H. S.**

IRWIN DLUGATCH

Electrical Engineering **Boys' High School**

Managing Editor 1935 Cable.

PHILIP R. DOWDEN

Chemical Engineering **Stuyvesant High School**

Member American Institute of Chemical Engineers.

JOHN DANIEL CZARNECKI

Chemical Engineering **Dickinson High School**

Member American Society for Metals, Member Cooper Union Chemical Society, Class Vice-president '33.

GERALD F. DALTON

Architecture **Black Rock College, Dublin, Ireland**

HAROLD D. DECKER

ΜΑΟ

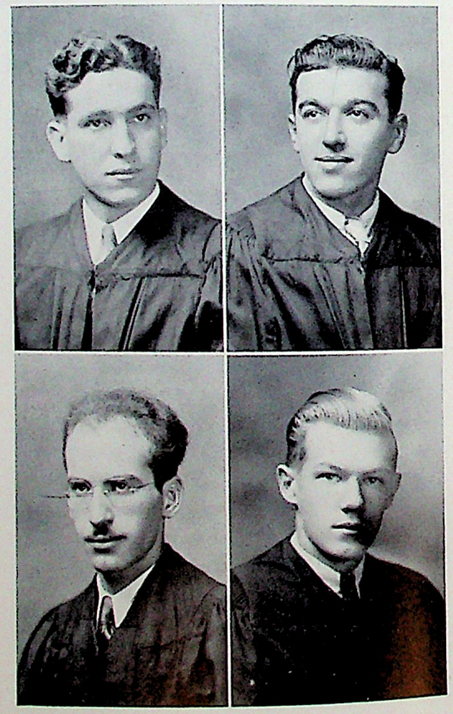
Electrical Engineering **Stuyvesant High School**

Member American Institute of Electrical Engineers, Mathematics Club, Rifle Club.

MICHAEL P. D'ELIA

Electrical Engineering **Brooklyn Technical H. S.**

Student Council '35, Class Treasurer '35, Member American Institute of Electrical Engineers, Mathematics Club.



ELSA-MARIE DOYLE

Decorative Design **Washington Irving H. S.**

Member Glee Club, Newman Club, Dramatic Club.

MARGARET G. DRAKE

Architecture **Columbia University**

Section Secretary '35, Class Secretary '36.

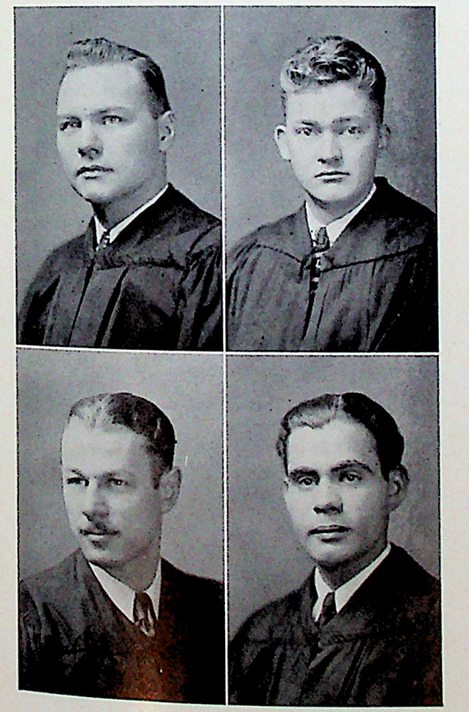
DAVID DRIMER

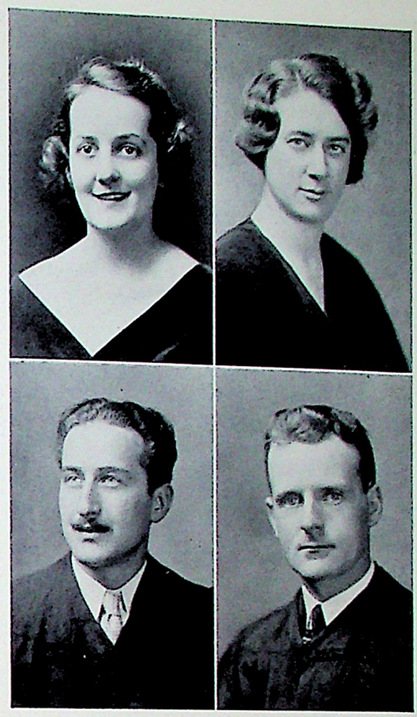
Chemical Engineering **DeWitt Clinton H. S.**

CHARLES DUFFY

Civil Engineering **Brooklyn Prep. School**

Class President 2 years, Student Council 2 years, Vice-chairman American Society of Civil Engineers 2 years.





RAYMOND B. DUGUID

ΦΣΩ

Electrical Engineering **Manual Training H. S.**

Annual Committee '36, Senior Hop Committee.

WALTER WILLIAM EDMAN

Chemical Engineering **Brooklyn Technical H. S.**

LEOPOLD EICHENBAUM

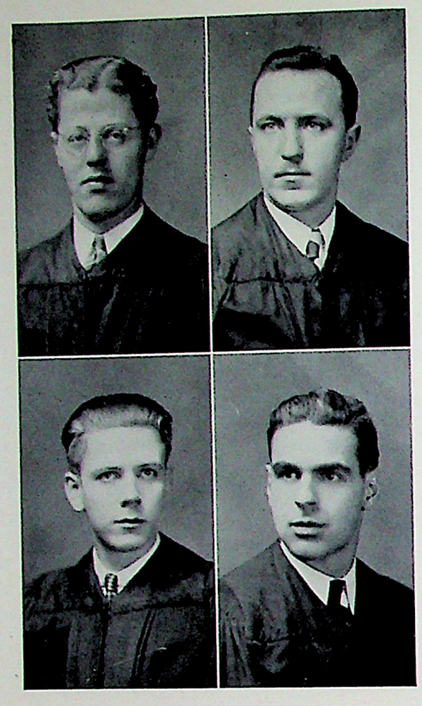
Civil Engineering **City College**

Basketball 4 years, Class President '34, Member General Students' Council '34, Board of Management Pioneer '35.

SIDNEY EITELBERG

Civil Engineering **City College**

Member American Society of Civil Engineers.



MILTON FINK

Mechanical Engineering **Morris High School**

Member American Society of Mechanical Engineers.

EDWARD GEORGE FISCHER, Jr.

Mechanical Engineering **Stuyvesant High School**

Member American Society of Mechanical Engineers, Mathematics Club, Interclass Basketball and Water Polo Teams.

ROBERT J. FLETCHER

Civil Engineering **White Plains High School**

Member American Society of Civil Engineers.

DAVID W. FRIEDMAN

Architecture **Brooklyn Technical High School**

Vice-president of Section '33.

MAC C. ELBAUM

Architecture **Stuyvesant High School**

FREDERICK EMIGHOLZ

ΩΔΦ

Chemical Engineering **Manual Training H. S.**

Class Treasurer '31, Class President and Member General Students' Council '32, Ex-Business Manager 1935 Cable.

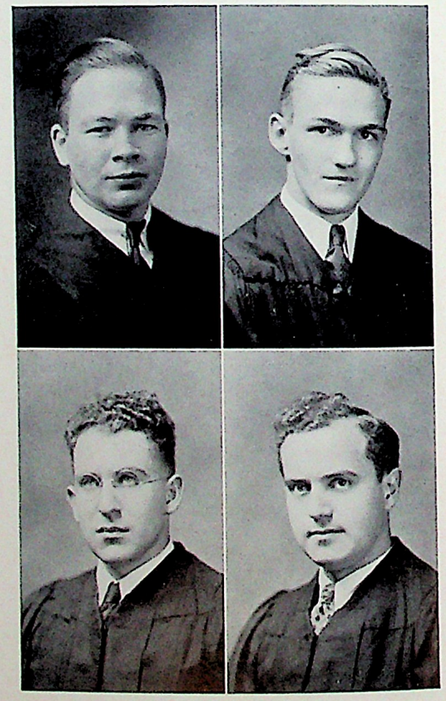
LEWIS EVANS

Electrical Engineering **Nyack High School**

Member American Institute of Electrical Engineers, Rifle Club.

JOSEPH FAMOSO

Civil Engineering **Pratt Institute**



SEYMOUR FRIEDMAN

Architecture **James Madison High School**

Football 3 years.

OSCAR M. GADEMANN

Electrical Engineering **Brooklyn Technical H. S.**

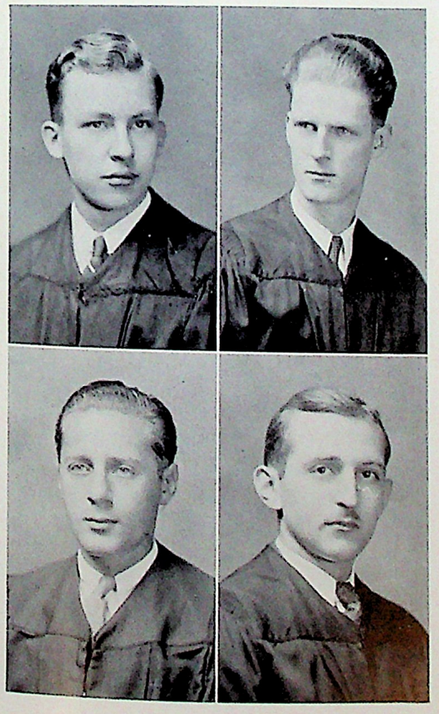
SALVATORE GANGI

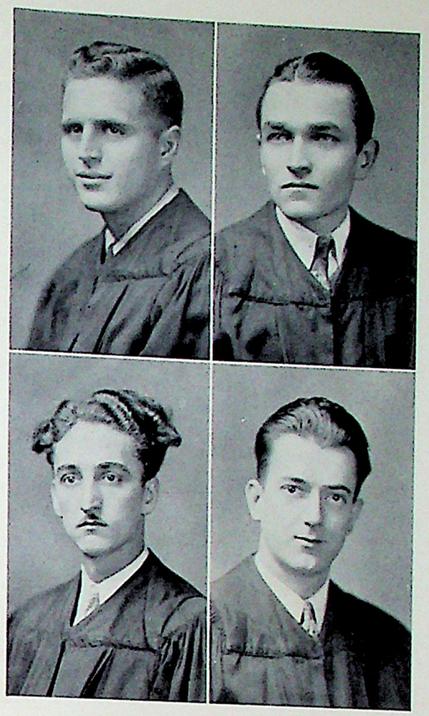
Mechanical Engineering **Seward Park H. S.**

Class Secretary '34, Member American Society of Mechanical Engineers.

VERNON L. GARRISON

Electrical Engineering **Curtis High School**





ROBERT A. GERHOLD

Electrical Engineering **Stuyvesant High School**

Member American Institute of Electrical Engineers, Mathematics Club, Rifle Club.

JAMES J. GILL

ΦΣΩ

Electrical Engineering **Regis High School**

Class Vice-president 2 Years, Class President 3 Years, Assistant Business Manager 1935 Cable, General Students' Council, Annual Committee '35, Blanket Fee Committee '36.

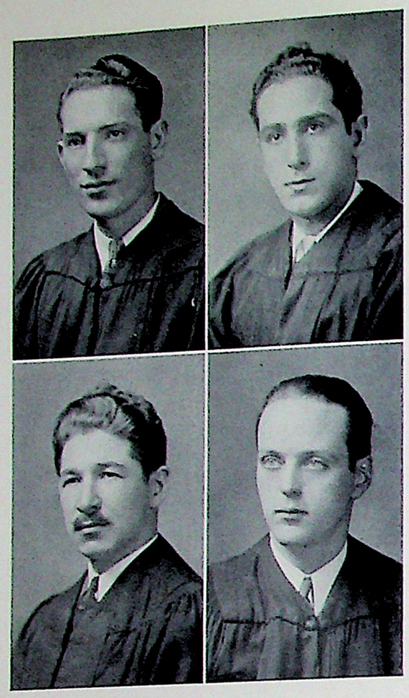
SAMUEL GINESIN

Civil Engineering **City College**

Member American Society of Civil Engineers.

MILTON GOLDBERG

Electrical Engineering **Thomas Jefferson H. S.**



NILS GRAVDAL

Electrical Engineering **Bay Ridge Evening H. S.**

BEN GRASSMAN

Electrical Engineering **Passaic High School**

Member American Institute of Electrical Engineers, Mathematics Club.

JULIAN F. GUDEL

Civil Engineering **Brooklyn Technical H. S.**

Member American Society of Civil Engineers.

SAMUEL GULKO

Architecture **Morris High School**

Section President 2 years, Class Treasurer 2 years.

LOUIS GOLDMAN

Chemical Engineering **Spring Valley High School**

Member American Institute of Chemical Engineers, Mathematics Club.

SYDNEY GOLDMAN

Architecture **Stuyvesant High School**

EDWARD GOLUB

Electrical Engineering **City College**

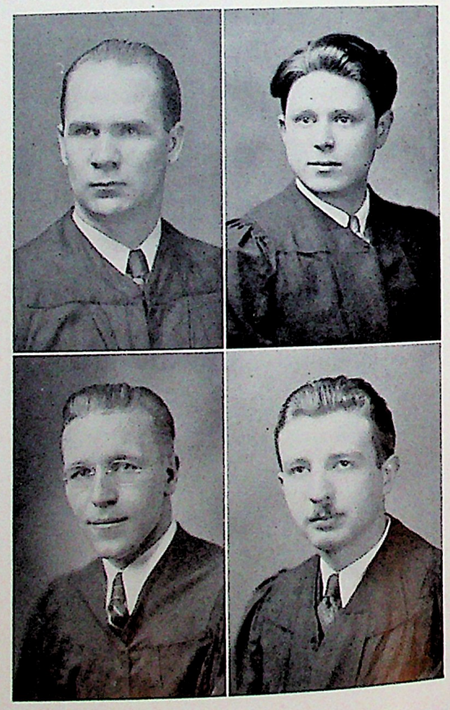
Member American Institute of Electrical Engineers, Mathematics Club, Glee Club.

CHARLES E. GORMAN

ΩΔΦ

Electrical Engineering **Flushing High School**

Treasurer '34, Chairman '36 American Society of Electrical Engineers.



EDWARD A. HANPASHIAN

Architecture **Stuyvesant High School**

ELEANOR A. HARTLEY

Decorative Design **Roosevelt High School**

Newman Club, Glee Club, Secretary of Junior Class '34, Dramatic Club.

BERNARD A. HEFFAN

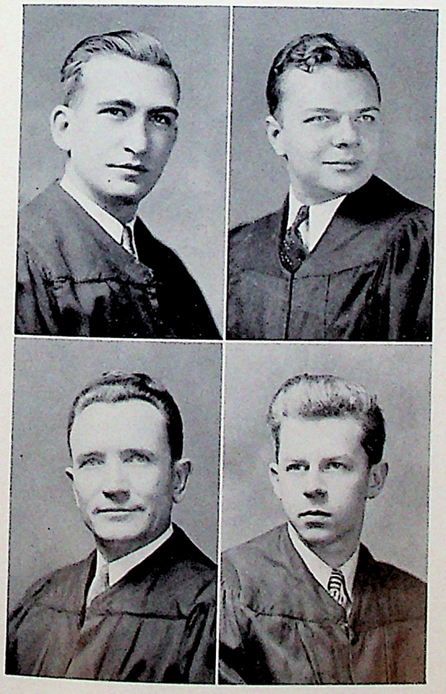
Architecture **Stuyvesant High School**

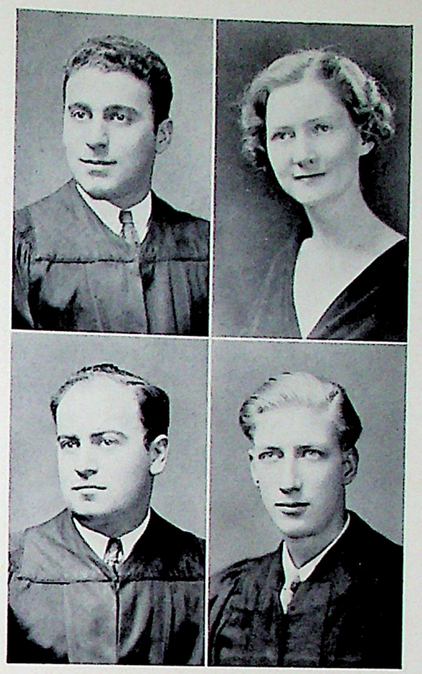
Section President '34, Section Secretary and Treasurer 2 years.

HARVEY W. HEINE

Civil Engineering **James Monroe High School**

Member Mathematics Club, Rifle Club.





ALBERT HERDMAN

Civil Engineering **Woodrow Wilson High School**

Member American Society of Civil Engineers, Class Vice-president '33.

ROY V. HIGH, Jr.

Chemical Engineering **Thomas Jefferson H. S.**

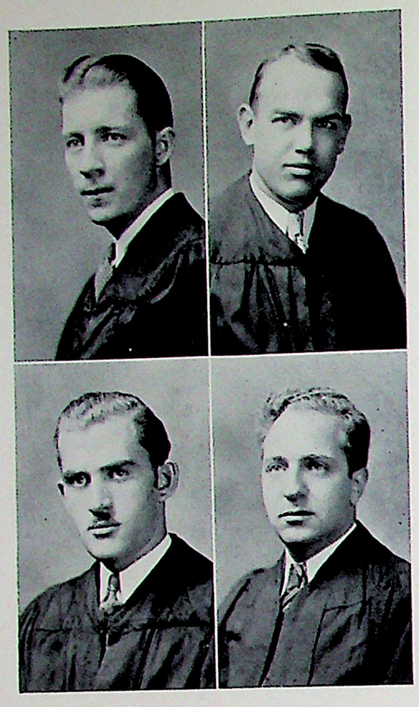
Member American Institute of Chemical Engineers, Mathematics Club.

JOSEPH A. HILL

Chemical Engineering **New Lots Evening H. S.**

FRED A. HOLT

Architecture **Pearl River High School**



STEPHEN G. HORESTA

Mechanical Engineering **Passaic High School**

Class Treasurer '34, Member American Society of Mechanical Engineers.

LEWIS A. HORNBY

Civil Engineering **Dickinson High School**

SAMUEL HUBERMAN

Architecture **Alexander Hamilton H. S.**

MEYER M. HUNGER

Chemical Engineering **Franklin K. Lane H. S.**

Class Secretary '34.

GEORGE H. INGRAM

Architecture **Ridgefield Park High School**

ERIC BABER ISAACS

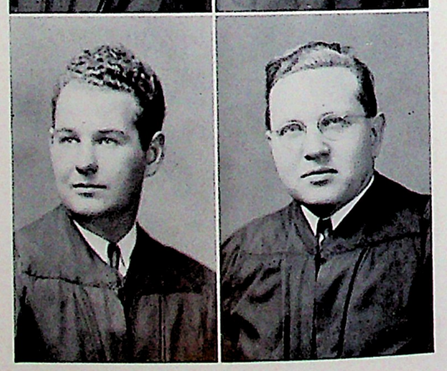
Architecture **St. Vincent's, Cambridge, England**

ARTHUR WILLIAM JENSKY

Architecture **Textile High School**

CHARLES A. JOHNSON

Electrical Engineering **Manual Training H. S.**



EDWIN JUD

Chemical Engineering **Jamaica High School**

Football '33, Mathematics Club, Member American Institute of Chemical Engineers.

GEORGE KARNOFSKY

Chemical Engineering **Brooklyn College**

Member American Institute of Chemical Engineers, Glee Club, Treasurer Mathematics Club.

EUGENE A. KELLY

ΩΔΦ

Chemical Engineering **Hempstead High School**

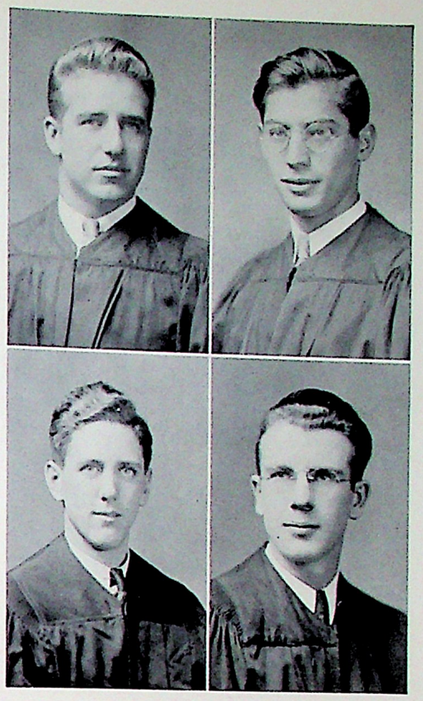
Class Pres. 3 years, Night Students Council 3 years, Pioneer 3 years, Annual Committee 5 years, Senior Hop Committee '36, Gold "C", Publicity Manager 1935 Cable, Entertainment Chairman Annual '36.

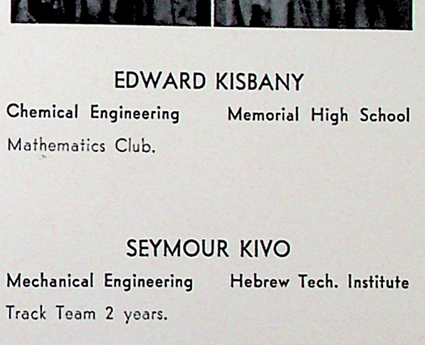
RAYMOND K. KILMER

ΦΣΩ

Electrical Engineering **Washington Irving H. S.**

Class Vice-president '33, Night Annual Committee, Junior Prom Committee, Member American Society of Electrical Engineers.





EDWARD KISBANY

Chemical Engineering **Memorial High School**

Mathematics Club.

SEYMOUR KIVO

Mechanical Engineering **Hebrew Tech. Institute**

Track Team 2 years.

GEORGE KLIGFIELD

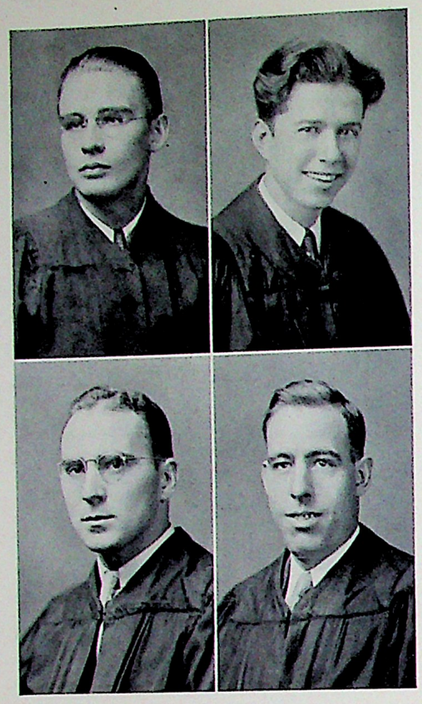
Mechanical Engineering **New Haven High School**

Class Treasurer '33, Business Manager 1935 Cable, Member American Society of Mechanical Engineers, Senior Hop Committee '36, Gold "C", Ex Post Facto.

FRED KORN

Mechanical Engineering **Stuyvesant High School**

Member American Society of Mechanical Engineers, Mathematics Club, Interclass Basketball and Water Polo Teams, Rifle Club.



JOHN A. KOSTRIZA

Electrical Engineering **Curtis Evening High School**

JOHN KOSZALKA

Architecture **Brooklyn Technical High School**

GEORGE M. KOVACSEVICS

ΩΔΦ

Electrical Engineering **Valley Stream High School**

Track Team 2 years, Football '32, Photo Editor 1935 Cable, Gold "C," Ex Post Facto.

PAUL C. KRUEGER

Civil Engineering **Stuyvesant High School**

Member American Society of Civil Engineers.

WALTER C. F. KUDAK

Civil Engineering **Rutgers University**

Member American Society of Civil Engineers, Glee Club, Mathematics Club, Swimming and Water Polo Teams.

LEO KUGLER

Electrical Engineering **Memorial High School**

Member American Institute of Electrical Engineers.

ARTHUR J. LANDSVERK

ΣΑΠ

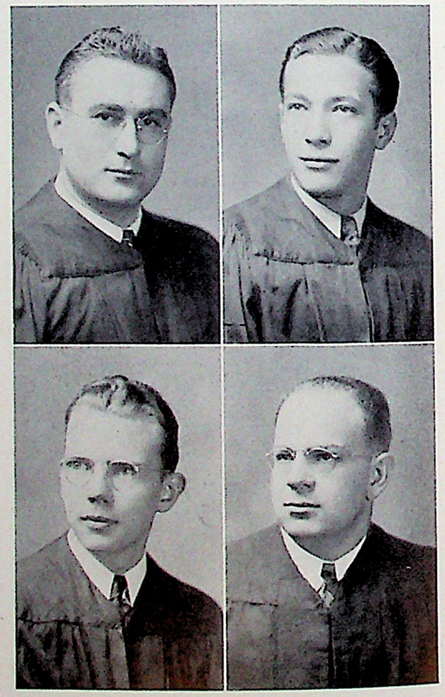
Electrical Engineering **Memorial High School**

Secretary American Institute of Electrical Engineers '34.

ARTHUR D. LANDIN

Civil Engineering **City College**

Member American Society of Civil Engineers.



JOHN A. LE MAIRE

ΩΔΦ

Electrical Engineering **New York University**

Pioneer '32, Class Secretary '32, General Students' Council '32, Member American Institute of Electrical Engineers, Glee Club, Mathematics Club.

CHARLES E. LEYES

ΩΔΦ

Chemical Engineering **Lincoln High School**

President American Institute of Chemical Engineers '35, Mathematics Club, Glee Club.

HENRY GEORGE LIEBER

Civil Engineering **Chaminade High School**

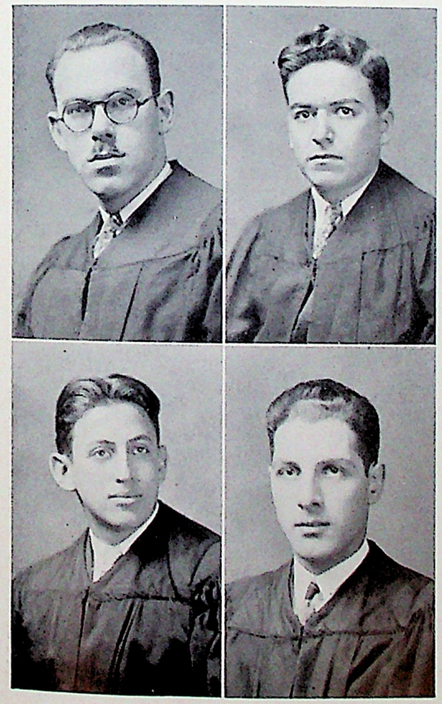
Member American Society of Civil Engineers, Mathematics Club, Orchestra.

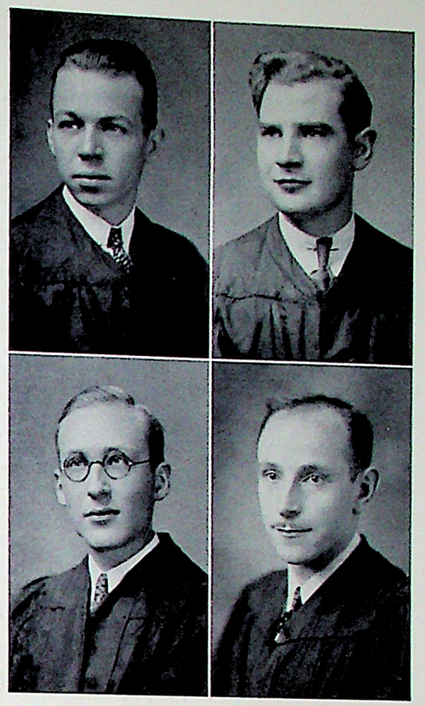
WERNER LINDHEIMER

ΛΜΣ

Mechanical Engineering **Eastern District H. S.**

Member American Society of Mechanical Engineers.





DAVID J. LINSKY

Civil Engineering **Morris High School**

Member American Society of Civil Engineers.

DAVID LIPSCHITZ

Civil Engineering **New Utrecht High School**

Member American Society of Civil Engineers.

MAURICE LIPSCHITZ

Mechanical Engineering **Lincoln High School**

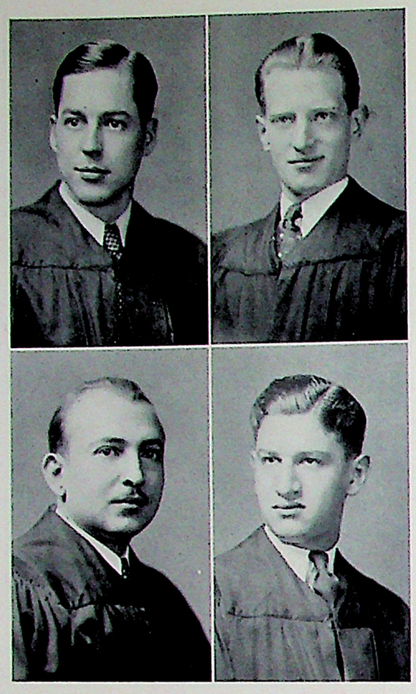
Basketball 3 years.

FRANK LO BUE

ΛΣΚ

Architecture **Stuyvesant High School**

Class Secretary '33, Architectural Students' Council '33.



LEO B. LUCKNER

Mechanical Engineering **Newtown High School**

Member American Society of Mechanical Engineers, Class President '36.

L. R. LUKANITSCH

Electrical Engineering **DeWitt Clinton H. S.**

CHARLES MALTER

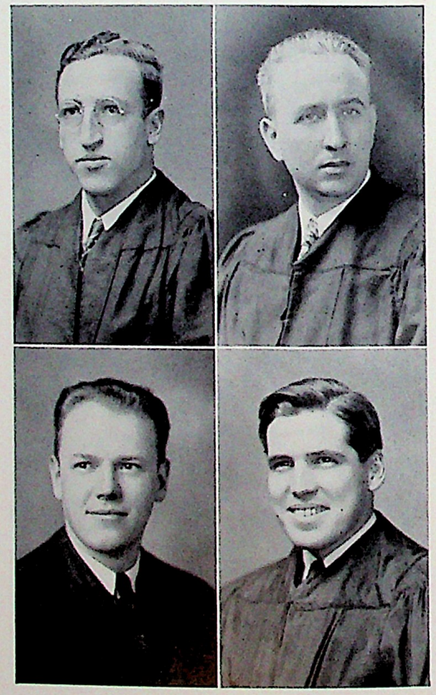
Civil Engineering **Stuyvesant High School**

JOSEPH MALTZ

ΜΑΟ, ΑΤ

Chemical Engineering **New Utrecht High School**

Member American Institute of Chemical Engineers, Schweinberg Scholarship, Treasurer '34, Pioneer News Editor '34, Pioneer Editor-in-Chief '35.



ADOLPH ALFRED MARRONE

Civil Engineering **Columbia University**

JOSEPH MARTINEZ

Mechanical Engineering **Haaren High School**

Member American Society of Mechanical Engineers.

DAVID L. MATSON

Electrical Engineering **Brooklyn Tech. H. S.**

Class Secretary '33, Class Vice-president '34.

JOSEPH F. McDONOUGH

ΛΣΚ

Architecture **Plainfield High School**

Class Treasurer 2 years.

JOHN J. McNERNEY

ΩΔΦ

Civil Engineering **Regis High School**

Pioneer Staff 3 years, Class Secretary '34, Member of American Society of Civil Engineers, Newman Club.

JACK I. MEDOFF

Chemical Engineering **Eastern Dist. High School**

Member American Institute of Chemical Engineers, Mathematics Club, Orchestra.

GERMANO MENDIZZA

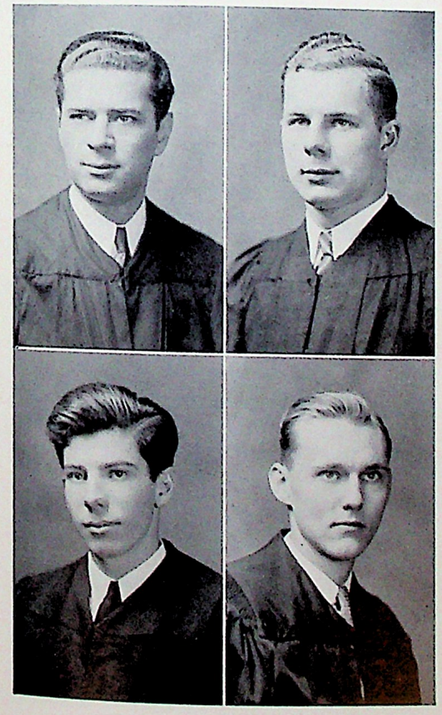
Civil Engineering **Curtis High School**

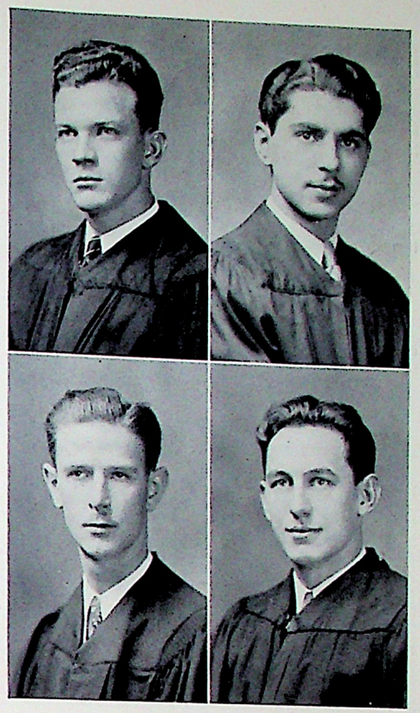
Member American Society of Civil Engineers.

CHARLES MIKULKA

Mechanical Engineering **Stuyvesant High School**

Basketball 4 years, General Students' Council 2 years, Vice-chairman General Students' Council 36, Gold "C", Pioneer Sports Editor '35, Chairman Blanket Fee Committee, Vice-chairman A.S.M.E., President A.A. '35.





HYMAN MILBERT

ΑΜΣ

Civil Engineering **New York University**

Member American Society of Civil Engineers.

EDMUND G. MONAK

Architecture **Textile High School**

Class Vice-president '36.

VINCENT T. MOORE

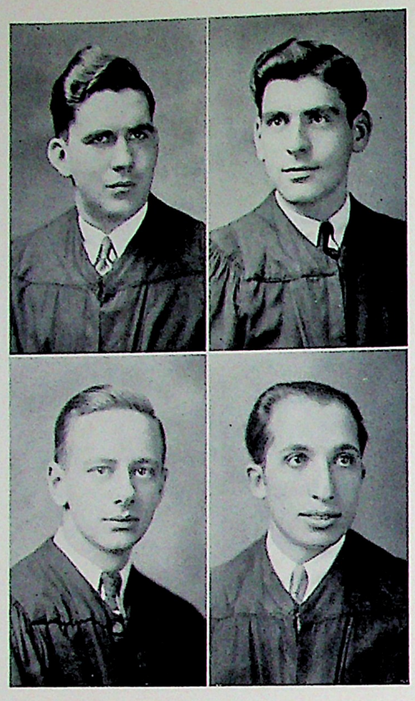
Mechanical Engineering **Port Washington H. S.**

Member American Society of Mechanical Engineers.

CHARLES B. MOTEJZIK

Chemical Engineering **Stuyvesant High School**

Secretary American Institute of Chemical Engineers, Glee Club, Mathematics Club.



ALFRED J. MUNN

Electrical Engineering **Washington Irving H. S.**

Class President 3 years, Class Treasurer '34.

ANTHONY JEAN NESTI

ΦΣΩ

Civil Engineering **Perth Amboy High School**

Track '33, Member American Society of Civil Engineers.

JOSEPH A. NORMANN

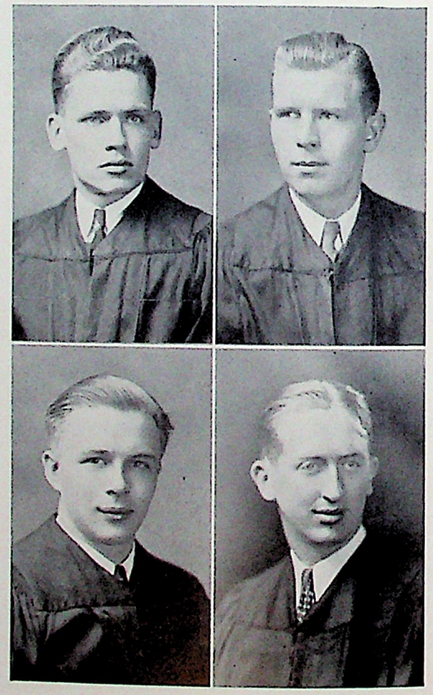
Electrical Engineering **Rugby Preparatory School**

Member American Society of Electrical Engineers.

JAMES OLIVERI

Architecture **Stuyvesant High School**

Secretary and Treasurer 2 years.



ILDEFONSO G. ORELLANA

ΩΔΦ

Electrical Engineering **Newtown High School**

Copy Editor 1935 Cable, Gold "C," Ex Post Facto, Newman Club.

DIEDRICH M. OSTERHOLZ

Electrical Engineering **Franklin K. Lane H. S.**

WILLIAM F. PARTRIDGE

Electrical Engineering **Poughkeepsie High School**

Member American Institute of Electrical Engineers, Mathematics Club.

LEON PASSEL

Civil Engineering **Morris High School**

Member American Society of Civil Engineers.

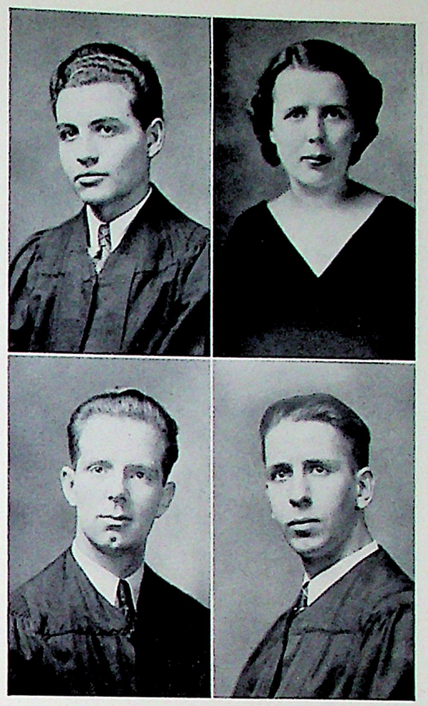
ABRAHAM PATT

MAO

Civil Engineering **Boys' High School**

LORENE PAYNE

Pictorial Illustration **Mars Hill College**



JOSEPH PELLEGRINELLI

Architecture **Textile High School**

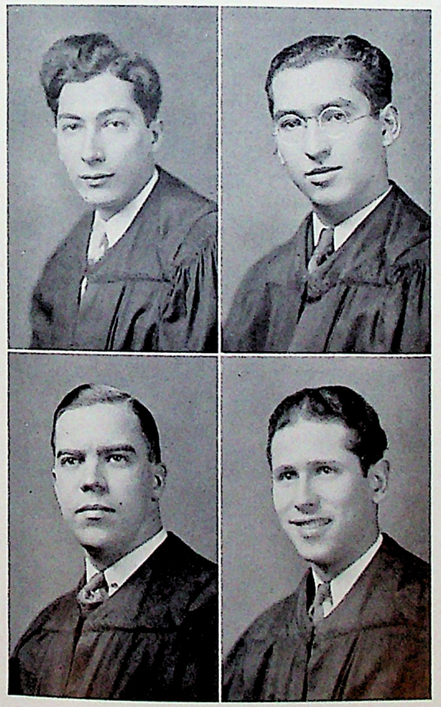
Sophomore Dance Committee '33, Junior Prom Committee '34, Class Treasurer '34, Class Vice-president '35.

WILLIAM PELLEGRINI

ΦΣΩ

Civil Engineering **Stuyvesant High School**

Member American Society of Civil Engineers.



IRVING PERLMAN

Electrical Engineering **Hebrew Tech. Institute**

MYRON HERBERT POLLYEA

Electrical Engineering **Brooklyn College**

Member American Institute of Electrical Engineers, Mathematics Club, Rifle Club, Chess Club.

WILLIAM S. QUICK

Electrical Engineering **Westfield High School**

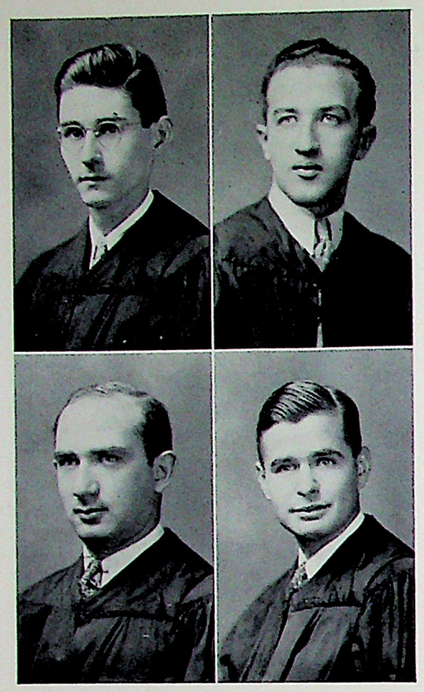
Class President 3 years, Chairman Junior Prom '34, Blanket Fee Committee, Gold "C," Chairman Gold "C" Committee '36, Annual Dance Committee 2 years.

ALFRED A. RATHOFER

ΛΣΚ

Architecture **Stuyvesant High School**

Soph. Hop '34, Junior Prom Committee, Business Chairman Annual Committee '36, Chairman Senior Ball '36, Class President '36, General Students' Council, Arch. Editor '36 Cable.



JOSEPH RUCHMAN

Civil Engineering — **New York University**

Member American Society of Civil Engineers.

ROBERT P. SCANLON

Electrical Engineering — **Regis High School**

Member American Institute of Electrical Engineers, Newman Club.

GEORGE C. SCHAAF

Mechanical Engineering — **Brooklyn Technical H. S.**

HYMAN SHARF

Mechanical Engineering — **City College**

THOMAS W. REYNOLDS

Civil Engineering — **Franklin K. Lane H. S.**

Member American Institute of Electrical Engineers.

ABRAHAM J. RICH

Electrical Engineering — **Franklin K. Lane H. S.**

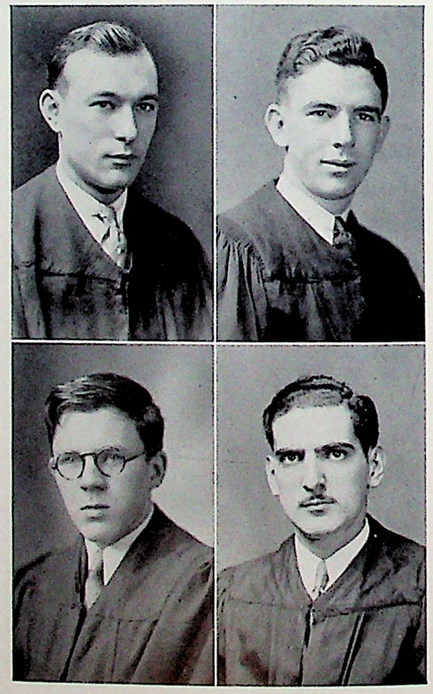
MARTIN RIVETZ

Civil Engineering — **Franklin K. Lane H. S.**

HARRY E. ROSENBERG

Chemical Engineering — **Linden High School**

Member American Institute of Chemical Engineers, Mathematics Club, Louis H. Landy Scholarship 2 years.



BERNARD SCHENKER

Electrical Engineering — **Memorial High School**

Vice-president '35, A.I.E.E., President Rifle Club '35, Rifle Team 3 years, Vice-president A.A. '35, Mathematics Club, Pioneer Staff '35, Associate Editor Pioneer '36, Night Annual Committee '36.

HYMAN J. SCHENKER

Architecture — **New Lots Evening High School**

ABRAHAM SCHNEIDER

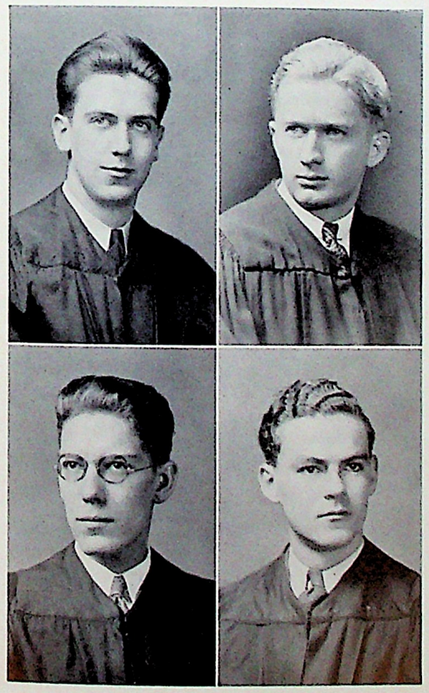
Chemical Engineering — **DeWitt Clinton H. S.**

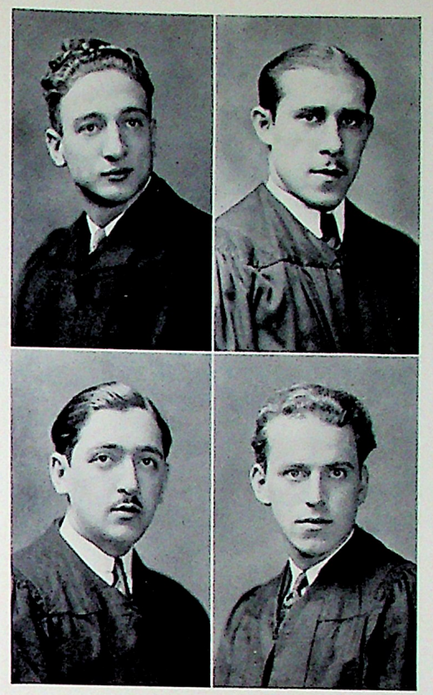
LOUIS JOSEPH SCHRAMM

AT

Chemical Engineering — **St. James High School**

Pioneer 3 years, Pioneer Business Manager '34, Advertising Manager '35, Class President '35, Vice-president Night Students' Council '36, Gold "C", Junior Prom, Senior Hop.





EDWARD H. SCHROEDER

Architecture — **Pearl River High School**

FRANK J. SCHMIDT

Civil Engineering — **Brooklyn Technical High School**

Pioneer Night News Editor '34, Junior Prom Committee '34, Member American Society of Civil Engineers.

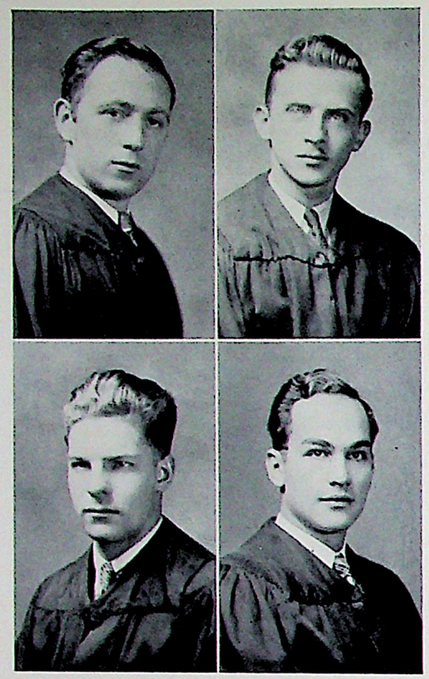
HENRY SCHUMACHER

Electrical Engineering — **Brooklyn Tech. High School**

JOHN A. SCULLY

Electrical Engineering — **Stuyvesant High School**

Member American Institute of Electrical Engineers, Mathematics Club, Chess Club.



ALEXANDER L. SEGALMAN

Civil Engineering **Brooklyn Technical H. S.**

Class President '34, Junior Prom, Senior Hop, Annual Committees, Treasurer Night Students' Council '34, Member American Society of Civil Engineers.

HARRY SHAFIROFF

Electrical Engineering **James Madison H. S.**

DEAN B. SEIFRIED

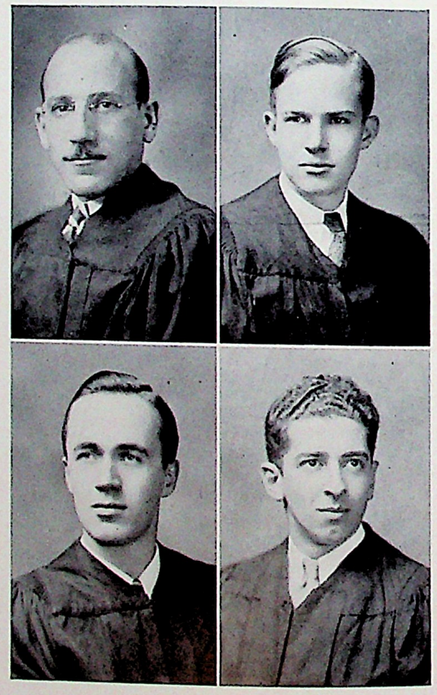
Electrical Engineering **Congers High School**

Member of American Institute of Electrical Engineers, Mathematics Club, Basketball 2 years, Pioneer '33, Rifle Club.

LEONARD SIEGEL

Civil Engineering **Lincoln High School**

Class Secretary '31.



SOL H. SILVERMAN

Mechanical Engineering **City College**

Member American Society of Mechanical Engineers.

HYLAS W. SMITH

Chemical Engineering **Flushing High School**

Member American Institute of Chemical Engineers, Mathematics Club, Rifle Club, Orchestra.

HENRY G. STAATERMAN

ΩΔΦ

Chemical Engineering **Institute of Technology**

Member American Institute of Chemical Engineers, Mathematics Club, Glee Club, Jacob H. Schiff Scholarship '36.

MILTON B. STEIN

Architecture **Long Beach High School**

Section Treasurer 3 years.

ADOLPH B. STERN

Civil Engineering **Townsend Harris Hall H. S.**

Mathematics Club.

ISADORE STILLMAN

Mechanical Engineering **Central High School**

Member American Society of Mechanical Engineers, Mathematics Club, Pioneer.

E. KING STODOLA

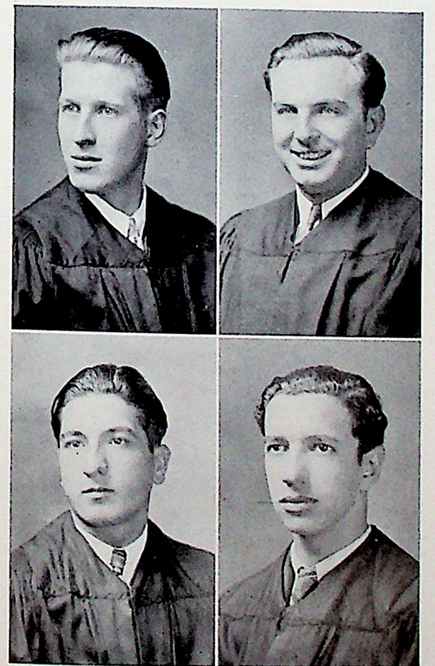
Electrical Engineering **Brooklyn Tech. H. S.**

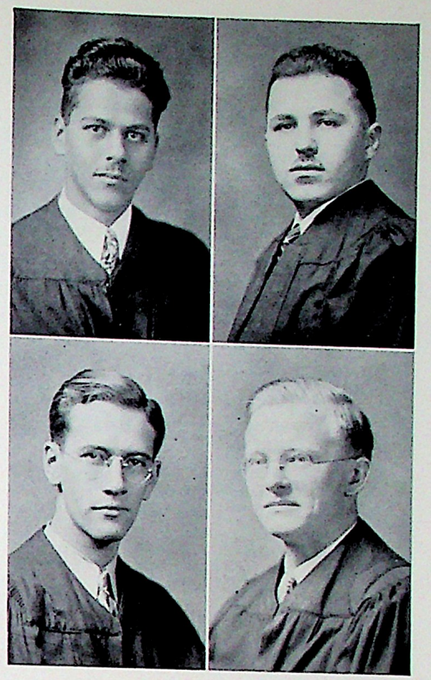
Student Council 2 years, Pioneer 3 years, Secretary American Institute of Electrical Engineers '34, Class Treasurer '36, Mathematics Club.

CHARLES LOUIS STUMPP

Chemical Engineering **Theodore Roosevelt H. S.**

Member American Institute of Chemical Engineers, President Rifle Club.





JOHN KAREL SUNDERMEYER

Civil Engineering **Central High School**

Member American Society of Civil Engineers.

PAUL TARAS

Civil Engineering **Morris High School**

JOHN T. TEDESCO

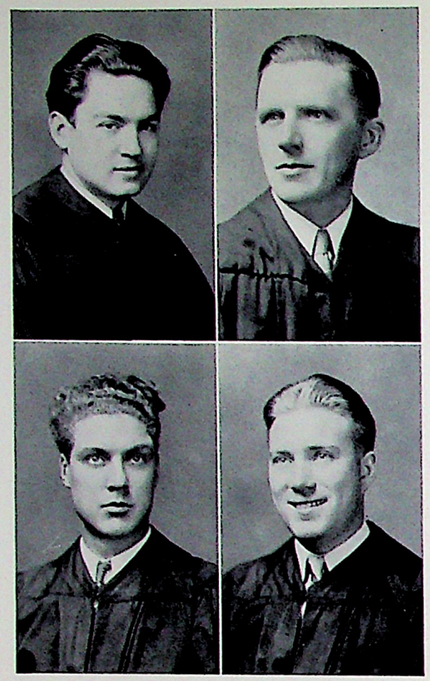
Mechanical Engineering **Stuyvesant High School**

Member American Society of Mechanical Engineers.

ALBERT TEITLER

Electrical Engineering **Boys High School**

Member American Institute of Electrical Engineers, Pioneer Technical Editor '33, Mathematics Club.



HARRY THOMASHEVSKY

Chemical Engineering **Stuyvesant High School**

FRANK A. TRACEY

ΦΣΩ

Civil Engineering **St. Peter's Prep**

Business Manager 1934 Cable, Chairman Junior Prom '35, Annual Committee '35, Senior Hop Committee '36, Treasurer Blanket Fee Committee, Class President '36, President Night and General Students' Councils '36, A.S.C.E., Gold "C", Ex Post Facto.

NICHOLAS J. TRIPOLI

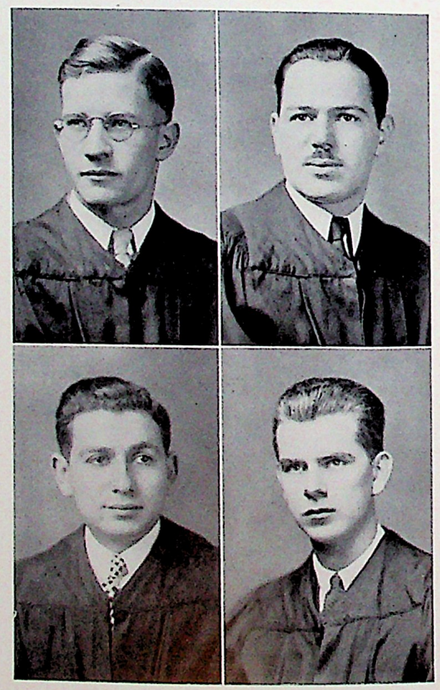
Architecture **Mechanics Institute**

THORALF E. THORSEN

ΩΔΦ

Electrical Engineering **Brooklyn Technical H. S.**

Class Treasurer '33, Junior Prom Committee '35, Senior Hop Committee '36, Sports Editor 1935 Cable.



HYMAN C. TURKIN

ΜΑΟ

Electrical Engineering **Thomas Jefferson H. S.**

President Mathematics Club, Class Secretary '35, Pioneer Associate Editor '33, President Chess Club.

JACK E. VELLEMAN

Electrical Engineering **Malden High School**

NATHAN WALD

Chemical Engineering **Eastern District H. S.**

Class President '35, Class Vice-president '36, Pioneer Circulation Manager '35 and Night Business Manager '36, Night Students' Council '35, Junior Prom Committee '35, Senior Ball Committee.

CLIFFORD A. WARREN

Electrical Engineering **Plainfield High School**

MILTON T. WAY

Electrical Engineering **Brooklyn Technical H. S.**

Class Secretary '32, Editor-in-Chief 1935 Cable, Class President '36, Gold "C", Ex Post Facto, Night Engineering Council.

JOHN ALEXANDER WEBER

ΜΑΟ

Electrical Engineering **Stuyvesant High School**

Students' Council '33, Secretary Rifle Club 2 years, President American Institute of Electrical Engineers '36, Class Vice-president '36.

RUDOLF V. WEGELE

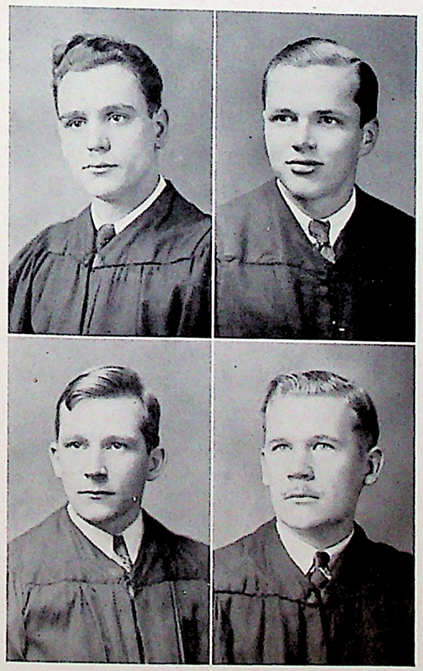
Electrical Engineering **Mt. Carmel College**

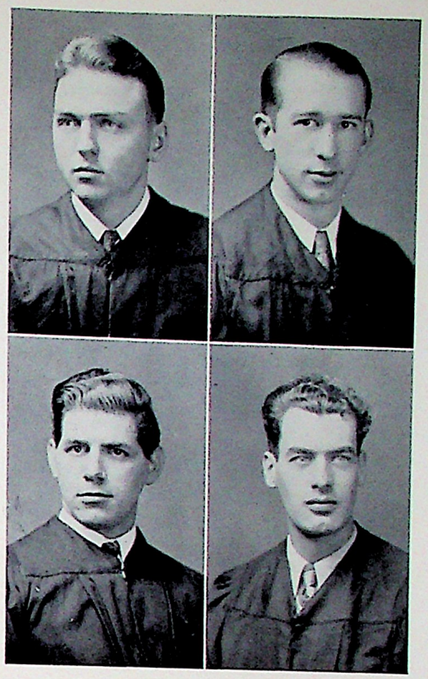
JOHN F. WESTMAN

ΦΣΩ

Civil Engineering **Haaren High School**

Member American Society of Civil Engineers, Business Chairman Junior Prom, Class Vice-president '36, Chairman Annual Committee '36, Business Chairman Senior Ball.





EDWARD G. WHITE

Electrical Engineering **Bushwick High School**

ROBERT WHITE

Chemical Engineering **Port Washington H. S.**

Member American Society of Chemical Engineers, Chess Club, Mathematics Club, Orchestra.

EVERETT WEISENDANGER

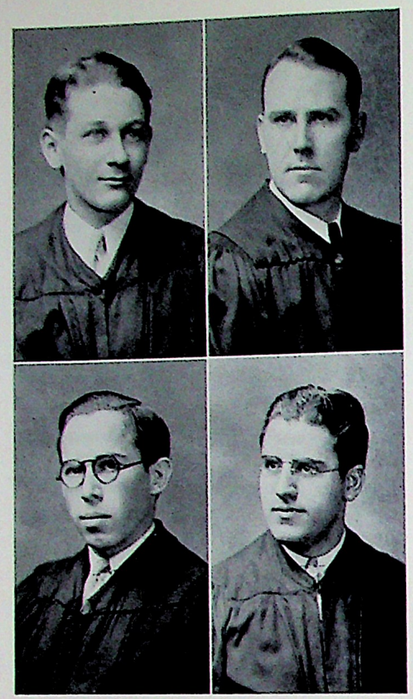
Electrical Engineering **Gorton High School**

Member American Society of Electrical Engineers.

PAUL T. WIIRI

Architecture **George Washington Evening High**

Section President 2 years.



MAX YESOWITZ

Mechanical Engineering **Drake University**

Class Vice-president '32, Class President '34, Circulation Manager 1935 Cable, Night Engineering Council '35, Secretary American Society of Mechanical Engineers, Gold "C," Ex Post Facto, Chairman Entertainment Committee Senior Ball.

GEORGE J. YOKOTA

Civil Engineering **Stuyvesant High School**

Mathematics Club, Rifle Team 3 years, Manager Rifle Team '36.

WALTER E. ZENONI

Electrical Engineering **Hebrew Tech. Institute**

Member American Institute of Electrical Engineers.

ALBERT A. ZUCKERMAN

Architecture **City College**

Class Vice-president '34, Class President '35.

EDWARD WILDERMUTH

Architecture **James Monroe High School**

EDMUND B. WILSON

Civil Engineering **Port Jervis High School**

Class President '32.

MORRIS WOLK

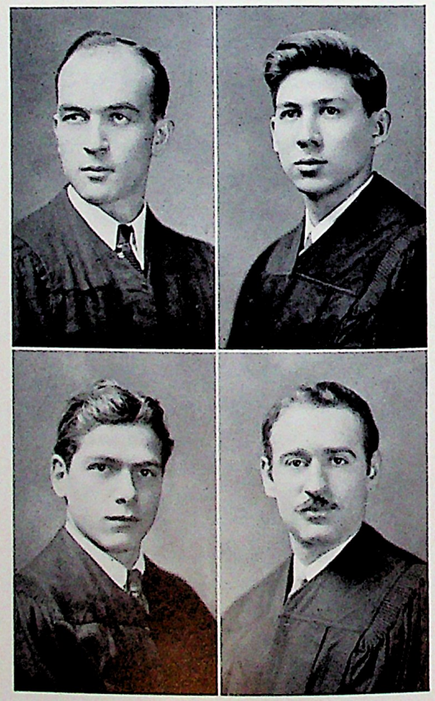
Chemical Engineering **Bayonne High School**

ALFRED J. YACOMELLI

ΛΣΚ

Architecture **Dickinson Evening High School**

Section Vice-president '33.



ARCHITECTURE

STYLES and trends in architecture have been historically excellent guides as to the development and expansion of social eras. Modern civilization with its rapid developments has tested the architect's power in adjusting his plans and designs frequently, in the course of a short time. In the United States development of industry caused growth of cities with large populations in confined areas. The need for space necessitated building upwards—hence the rise of the skyscraper.

Ease of covering distances, industrialization of new geographical areas, the extensive use of the aeroplane are eliminating the need and desirability for concentrated populations. In the completion of the inevitable cycle, the skyscraper has literally and figuratively reached the highpoint of its career, and will before long be outmoded. The approaching trend toward decentralization rather than concentration of cities is having a marked effect on architectural developments.

The architect of the twentieth century is both designer and engineer. His work comprises not only artistic designing but considerations as to structure, stability, space, lighting, ventilation. Recent noteworthy features in architectural planning are the use of steel structures; the betterment of sound-proof facilities; the construction of windowless buildings and glass walls; the planning of model homes; pre-fabricated houses; unified building groups like Knickerbocker Village; and of course, the newest skyscrapers and their internal and external developments.

Although the skyscraper may be about to begin its decline, the Empire State Building of New York City will stand as a world monument to the architectural craftsmen who conceived and executed this colossal exemplification of scientific progress. It is the tallest building in the world today, two hundred and sixty feet taller than the famous Eiffel Tower. Including its base, five stories high, there rise 103 stories, 1250 feet, nearly a quarter of a mile of vertical distance.

The architects faced a stupendous task in the building of the Empire State. They had definite limitations—the size, 36,000,000 cubic feet; the sum available for construction; the size of the site; the elements of time (20 months); and the limitations of the city zoning law—these were unchangeable restrictions.

This last factor, the legal restrictions, helped to give shape to the great building. Although the site for the building covers two acres, 83,860 square feet, because of the zoning laws, the architects could plan to build to a considerable height in only a quarter of this area. On the Fifth Avenue frontage, the law allows buildings to rise sheer from the sidewalk, only 125 feet; at that height the law requires a "set-back."

OPEN UNTIL
LIBRARY

Instead of allowing the problem to hamper their work, the architects took advantage of this feature as an element of design, to produce a majestic building truly scraping the sky.

Like all tall buildings, the Empire State is set upon the earth itself, the firmest foundation which can be supplied by man or nature. It was fortunate that on the site selected, bed-rock, Manhattan's underlying stratum of granite, was near the surface. Empire State reaches down only two floors, thirty-three feet below the sidewalk. It reaches down into the earth and up into the clouds.

Residents and visitors looking up at the magnificent structure marvel that the sun seems always to be shining directly upon it. This seeming phenomenon is an illusion created by the use on the outer walls, of chrome-nickel steel, a new alloy which never tarnishes or grows dull. Between the top of each window and the sill of the window above, there is placed a flat plate of dull silver aluminum, sand-blasted to obtain a smooth surface. These silver aluminum plates, blending with the glass of the windows, between the columns of chrome-nickel steel, give the building the appearance of a lustrous, shining spire.

Statistics concerning the building are overwhelming. The dimensions of the plot are 197.5 feet on Fifth Avenue, 424.95 on 34th and 33rd Streets. There are sixty-three elevators, and four freight elevators. All are Otis signal control, self leveling. Express cars reach the 80th floor in less than one minute. Elevators rise at a speed of 1,200 feet per minute. Empire State is the fulfillment of the architect's dream.

Equal in interest as an architectural project is the development which extends from 48th Street to 51st Street between Fifth and Sixth Avenues—the largest building project ever undertaken at one time by private capital—Rockefeller Center. The present plan includes eleven buildings. Nearly two acres of land in Rockefeller Center have been used to provide open space between buildings and adequate facilities for vehicular and pedestrian traffic in the vicinity of the development. This area, named "Rockefeller Plaza," includes a new private street cutting through the project from 48th to 51st Streets, a large sunken plaza in the middle of the block, and a walkway called the Channel, sixty feet wide, which leads into the sunken plaza from Fifth Avenue and affords a convenient gateway to all the buildings in Rockefeller Center.

The RCA Building is the dominant structure of the Rockefeller Center group. Its main tower rises with sweeping lines to a height of 850 feet. In the tower, as is customary in modern skyscraper design, the elevators and service facilities form the core of the building, which is surrounded on all sides by well-lighted floor space.

From the comparatively low buildings on the Fifth Avenue front to the soaring 70-story office and studio building in the center background, all the structures in Rockefeller Center were designed to achieve utility, balance, beauty and interrelated service.

The architect has not restricted his thought and skill to super-structures; the modern home has received its share of attention. Excerpts from an article in a recent issue of a daily newspaper show the interest in developing houses with modern materials in modern design.

"Pre-fabricated steel houses soon may begin coming off the automobile industry's line along with the beer barrels and bathtubs with which some motor body concerns now are diversifying their business.

"With the engineering and metallurgical knowledge gained in the production of machines for transportation, some units of the industry are seeking to develop what L. E. Corbusier, a leading exponent of 'functional' living, has described as 'machines for living.'

"Refrigerator manufacturers also are deeply interested, since air-conditioning equipment will be an integral part of the new houses, and several of them are understood to be working on plans to enter the housing field.

"The new houses, including plumbing and fixtures, lighting, heating, refrigerating and air-conditioning equipment, will be sold as a unit to be assembled quickly on the purchaser's lot. Various modern appliances are to be built into the houses at the factory.

"Insulated steel panels, produced in a variety of standard sizes on giant presses of the kind used to stamp out automobile bodies, will form a major part of the 'functional' houses.

"Tests are reported to have shown that panels made of two metal sheets with insulating material compressed between them are as efficient as a stone wall six feet thick in excluding heat or cold.

"The panels may be utilized in any one of a number of house designs on which architects are at work, and the houses subsequently could be enlarged readily by the addition of one or more standard room units."

In all of his work, the architect of this century has shown a commendable adaptability, a wonderful spirit of progress. He combines the ability of the designer and the craftsman, the artist and the scientist. He builds for utility and for beauty. His work is extending beyond the creation of an individual public building or a single home. There is before him the problem of planning entire cities, cities that will have the tempo of today's automobile, aeroplane, radio; towns that will incorporate all pragmatic necessities and that will, at the same time, be places of peaceful beauty!

CLASSES

NIGHT SCHOOL OF ART

ARCHITECTURE–CLASS OF 1937

Irving Friedman
President
Theodore Randmetz
Vice-president
Hyman Black
Secretary
Alfred Racz
Treasurer

And another Architect bit the dust! There are only thirty-five left now. Woe is me! Woe is me! Eighty-five cheerful, undaunted freshmen entered these antique brown walls in 1933. Before long, however, any interested observer could have noticed the rapidly evaporating good humor. But indeed—there was just cause for this behavior. Things were a little tougher than any had bargained for. So much tougher that now, as we who continue in the Junior year look around us and see a few smatterings of brother students trying oh, so hard—we cannot help but wonder: Who next? As we listen to Mr. Entwistle droning away with concrete facts, estimating quantities, and sleeper floor-fills, we notice one or two of the less fortunate students drooping their heads with exhaustion. It seems that working during the day, going to school at night, and studying over the week-end is a bit more than one's physical constitution can take.

Turn back the pages of history to the freshman year. Innocent babes in a wood of mathematical genius and drafting expertness! Despite the confusion and uncertainty of beginning our architectural careers, we managed somehow to hold a successful Dinner-Dance. This fact was undoubtedly brought about by the great team-work of officers and students. Our aristocratic President, Mr. Munzer, made a never-to-be-forgotten entrance at the affair by arriving quite late but nattily attired in silk topper, tails, studs and cane, preceded by his exquisitely gowned wife. This affair took place at Young's. A small corner was sufficient to take care of the seven (Tell me not in mournful numbers) couples.

Sophomorically speaking, nominations were again taken. Candidates gave speeches profuse with campaign platforms. Ballots were taken not once but three times for the Vice-presidency. Who is the Vice-president; does he do any work? No! Just a figurehead for the CABLE. To think that such a person could throw the proverbial monkey-wrench into a well-organized, well-planned machine. Out of this confusion, however, came the final results. Mr. Bobkowski, the President, a capable, hard-working leader; Mr. Reihl, the Vice-president, an able assistant to the President; Mr. Hopper, invaluable Secretary; and Mr. Friedman, the detective Treasurer, who could spy a nickel lying in the pocket of a classmate ten feet away, and through a little sales talk, obtain the coin as part of the class dues.

Mr. Bobkowski, working rapidly, obtained permission for the use of Room 23 for monthly class meetings, which proved to be of great value. At this time a financial graph was inaugurated showing the progress of the class in CABLE, Pioneer, and class dues, and also keeping an accurate account of all students in their payments of dues. We sophomores were never backward in support of the CABLE and Pioneer. Our class write-ups appeared weekly in the Pioneer and our material was so inexhaustive that frantic Engineers were trying all methods to stop the over-abundance of print from the Soph Archs.

An amusing activity of the second year architects was the dancing classes which were held in Room 22, Foundation Building, from 6 to 7 p.m. every evening. Not only amusing but practical, for many students could not attend social activities because of their inability to dance. This fault cured, we were assured of a successful Soph Hop which was held in the form of a Dinner-Dance. This affair, held at the Hotel Brittany, was one of the most successful ever to have taken place in the annals of Cooper Union's Soph classes. Neil Neilson and his orchestra contributed further to the enjoyment of all attending. Scotty, superintendent of the Foundation Building, stated that he never had so much fun in the ten years of his association with Cooper Union and its affairs. All this was due to the hard work of Mr. Bobkowski and the Committee, thus bringing a grand finale to the affairs of the Sophomore class.

Now is the time for all good men to come to the aid of their party. And so it was. The Juniors, tired of having their pockets picked by the ever-outstretched hand of their Treasurer, Irving Friedman, tactfully elected him President. That taken care of, they became more tactful and elected new men for the next three offices: Irving Rubin, Vice-president; Theodore Racz, Treasurer; and Harold Black, Secretary. The money Racz started collecting went to his head so he begot himself a bride. Rubin, who had two and a half weeks to write all this, welched on us and so it was three other guys who did it. Harold (Deah me!) Black, our erstwhile esteemed Secretary, laughs at all our worst gags, so who cares if his name is Harold.

Now let's go down the line and see who are the hopelessly entangled, unfortunate men deigned to remain the colleagues of those higher-ups (so effervescently spoken of above) for still another year.

Al "Bob" Bobkowski, a steadfast man and true, has been one of the outstanding examples of the type of men who go to this school. Our President last year, he has had a brother make entry under his own colors but following in his footsteps. Ed Briglia, added baggage of section F, answers to his name when attendance is called. Lloyd "Butch" Fleischman, the good old Jersey boy, is an LSK man. Vic Gorlack admits that two points separate a straight line which is stretched across to make it the shortest distance. Emil "Dutch" Goerner likes his beer, and how! He and Dick Hopper, the "Richard" guy (and does he like that name) bend the elbows often. Morris "Murray Lane" Levine knows more about his school song and dancing classes than he does about architecture, but he'll do in a pinch provided he isn't pinched too hard. Irv Papiroff, AAA-1 rating for his poster work in and around Cooper's halls. Ted "Accordion" Randmetz, according to him he'd rather paint. Saul Rollner, a gagman, was all but gagged after one of his "slightly" funny puns. Jack Schwartz, who still has his finger, has two parts still trying to grow together. Don Sellnow, a giggling haw! haw! man, laughs at his own cracks among others. Norm Slonim in-

sists we are wasting our time in school since we are getting no degrees for our work here, but continues nevertheless. Jack Stein, the man who couldn't see it our way, has awakened at last. Ralph Teitleswaig, swell with pen and ink, is a capable worker. Hy Wechter is a "do or die" fellow. Well, if he doesn't do it, he will die. Ted Wittenberg, a constant "Camel" chiseler, recently refused a Chesterfield, so beggars can be choosers. Tom Zabski, just a T.D.H. John Zinner, one of the best, maybe better. S. Vincent Schulman, knows that he knows but only he knows it. V. "Prestie" Prestigiacomo—Oh, what a name. For a year he couldn't recognize it after winning twice in the Pioneer's Football Contest. He finally claimed his reward. Bill Basoff —one of the three musketeers—had as his fellow-flies, Gentile and De Leo (another one who dropped out). Charles Frederickson, supposed to do this and supposed to collect the Blanket Fee. Well, anyway, he's supposed to. Harry "Kochie" Kochman—so coy he's "skeered" of his own voice. Joseph Markowski, a nice chap, but just another name. Lou Maschi, a swell little fellow, but awfully little (just like "Blackie"). Bob Miller—spectacular—he wears spectacles. Joe Mishure, a sure first mention in any exhibition of Architectural Works. Bill Murray, one of the three who ran for Vice-president three years ago and did not get in, is one of class "E." Emil Riehl, the odorous one—burp, burp, my fair friend, but not in this direction. Len Trentin, the last on the list, but glad he's not missed; for he knows not the gist of this tightly clenched fist.

It seemed, as we were writing these quips and cracks, that we were slighting those who were in our classes the years before, but after considering the facts of the case we think that they have slighted us.

Now, as we finish, our class has dropped ten notches to the colossal total attendance of twenty-five. We've a pretty good percentage at that, twenty-five out of eighty-five. We're almost batting .300. Save the pieces!

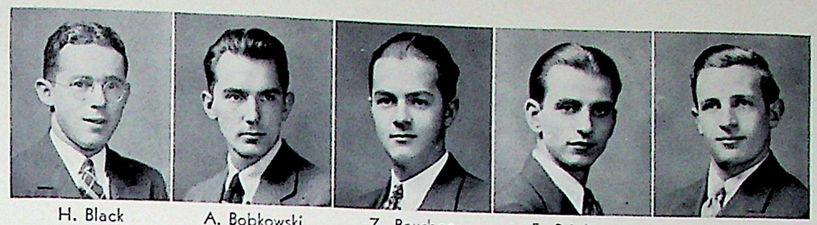
But, for all that, as the light of another year grows steadily dimmer, the Junior Arch. class works diligently. The work in this Junior Year has been more difficult than in previous years. Heretofore the Junior Year consisted of two sections, one design and one construction. This year, however, the students were given no choice. All had to take both, besides Estimating and Specification Writing. The course thus far has proven rather difficult, but the Junior Class, with a few exceptions, seems to be weathering the storm rather well and, as usual, will make port safely.

One thing we rue. We have established another record for the books—this time, to our disfavor. We had no Junior Prom. For years this gala occasion has been the most talked of affair. Now, and for the next year, it will be a matter hushed, as though doubted.

The boys who entered three years ago, and still remain among our ranks, have changed tremendously. 'Tis said, "Boys will be boys," but here is the exception that proves the rule—those "boys" are now MEN.

With one year to go, who can say we have not tried. Here is the survival of the fittest. The class is not a bit daunted by the barren spaces in their rooms.

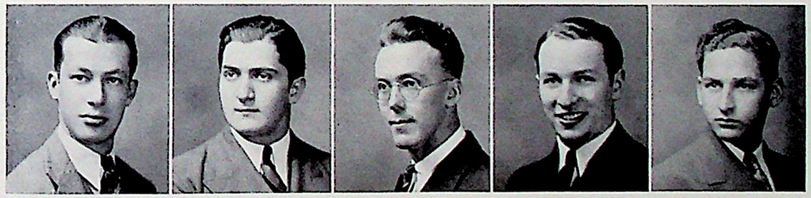
As a whole, all they seem to be is the depression's gift to The Cooper Union, and, as they are part of the depression, all they form is a dent, but since a dent is a hole, and a hole is nothing, what have we been talking about?



H. Black | A. Bobkowski | Z. Bourbon | E. Briglia | L. Flieschman

I. Friedman | E. Goernor | V. Gorlach | R. Hopper | M. Levine

I. Papiroff | V. Prestigiacoma | A. Racz | E. Riehl | S. Rollner



J. Schwartz | S. Schulman | D. Sellnow | N. Slonim | J. Steinman

R. Teitleswaig | L. Trentin | H. Wechter | T. Wittenberg | T. Zabski

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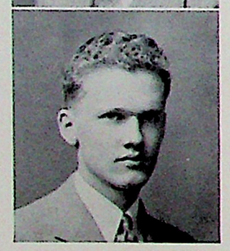
INSTITUTE OF TECHNOLOGY

CLASS OF 1937



Frank Adams
President

George Green
Vice-president

Irving Margolis
Secretary

Gerald Varnum
Treasurer

Registration day is here again, bringing with it reunions by the score. Tales of the summer's adventures are on everyone's lips—one had worked during his vacation; another had a real vacation camping "on the trail"; a third "enjoyed" his summer studying for his re-exams; while still another detailed his voyage on a tramp steamer. However, all this was put behind us when the Dean's "Welcome Back to Cooper Union" at first assembly officially ended vacation time and we enthusiastically entered into the work of the new term.

For most of us the work of the Junior year gave us our first real contact with the engineering field. The two previous years had been taken up with much that was merely preparation for the present actual professional training. Subjects such as Advanced Surveying and Geodesy for the Civils; Direct Current Machines and Alternating Current I for the Electricals; Mechanical Processes and Machine Design for the Mechanical Engineers; Organic Chemistry and Fluid Dynamics for the Chemical students gave us tangible proof of definite contact with actual subjects relating to our prospective technical fields.

Our class, which up to now had studied more or less as a single unit, was split up into the four really definite engineering departments. This change in curriculum was accompanied by a change in thought. Where once the glory and romance of our intended professions had captured our youthful imagination, now cold, hard-headed facts and sound practical information gave concrete substance to these early dreams.

Tenable proof of our advancement to the specialized branches of Engineering were the pins we wore with such great pride as members of the student branches of the professional societies. These student organizations presented interesting lectures and lecture-tours. The A.I.E.E. provided both student and faculty speakers and several guided tours through power plants and generating stations in the metropolitan area. The A.I.Ch.E. held its traditional freshman reception at Christmas time. The A.S.M.E. featured many prominent speakers in the engineering field and the A.S.C.E. presented an interesting program of lectures and field trips to places of civil engineering interest.

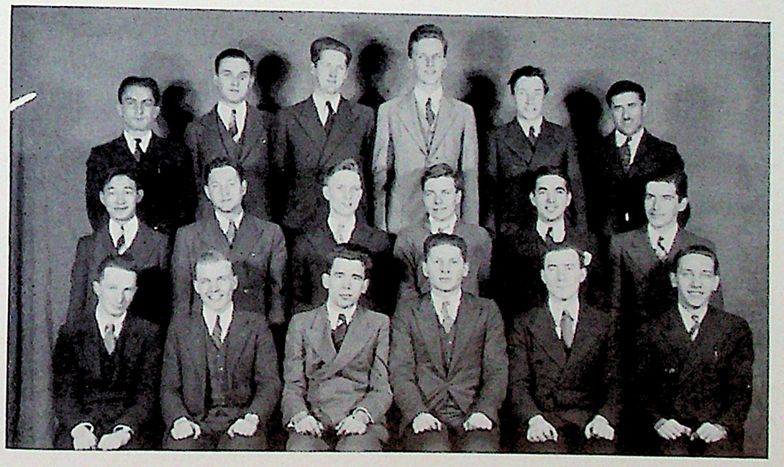
Cooper Union Library

Another notable influence on our thoughts was made this year by the innovation of the Professional Aspects Hour. This period was spent either in meetings of the student branches of the engineering societies, viewing motion pictures of engineering projects in process of construction, or listening to prominent speakers. The motion pictures presented to us a vivid, graphical view of actual engineering processes as practiced now; whereas, previously, we had to be satisfied perforce with mere discussions of these procedures in our class periods. The speakers, men foremost in their respective engineering fields, set forth a different viewpoint from ours. We were accustomed to look from the inside and they gave us the benefit of their practical experience on the outside.

Even though the class had been broken up into four distinct sections, it still acted as a unit in supporting the various extra-curricular activities. Not only the Blanket Fee, but also the CABLE, the Pioneer, the Athletic Association, and the student engineering societies have received their full share of support from the class of 1937. Many of the members of the class are taking prominent parts in all the affairs mentioned above.

One of the main forces still holding the class together is the intra-mural sports conducted by the Athletic Association at the Christadora House. These sports were a primary means of welding us into a compact body, bound with a strong feeling of comradeship. To those men who attended and participated, the scheduled events were a fine source of diversion and entertainment. Furious battles during the water polo contests, and keen, good-natured rivalry between the class basketball teams, kept our interest aroused to the fever heat.

Our class possesses one unique quality which has never before existed in the annals of Cooper Union. With the six-year course replacing the five-year course, there is no class of 1937 in the Night School. The graduating class of 1937 will thus

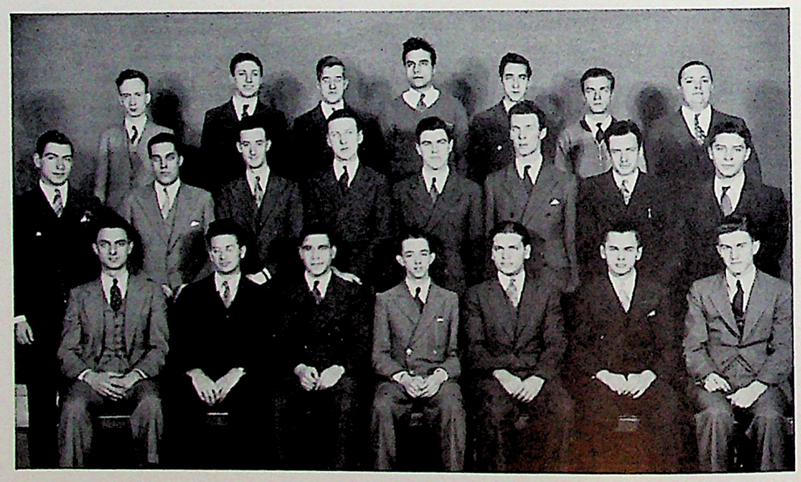


Top Row—De Pierre, Umbdenstock, Kirby, Varnum, Scheibel, Shalita. Middle Row—Chen, Berman, De Ritter, Anderson, Demasi, Wiswall. Bottom Row—Deed, Schallis, Baum, Hashmall, Gould, Last.

be cut in half. Because of reduced numbers social functions such as the Junior Prom and the Senior Ball become impracticable which is indeed lamentable.

Meanwhile, the lopping off of students from the tree of 1937 goes on and on. Some, due to adverse circumstances, are in the Night School; others have become irregular, while a goodly portion have just "given up." The high mortality rate is no doubt due to the constant arduous work. Two, and only two, of the six Mechanical students began as members of our class. The other sections have fared better due to their greater numbers. Each section had its own troubles. The M.E.'s puzzled over heat power calculations and machine designs but enjoyed at the same time their power plant inspection. The C.E.'s forever complained about their tough Hydraulics course, stresses in frame structures, etc. The Ch.E.'s were stuffed with organic and physical chemistry, their chief bugaboo being their Electrical Engineering subjects. The E.E.'s were always bemoaning the fact that they took every course before the other sections and they had no chance to "crib." In addition, they would walk around (you could always spot an E.E.—he was frantic about getting in some report on time) in a daze, staggering under tremendous loads of laboratory drawings and reports. We realize that although we have had much work throughout the past years, we have gained in knowledge and experience an amount far exceeding our limited efforts. We pause a moment to reflect and our courage is renewed by the revelation.

But all these worries and troubles fade when we think of what lies beyond graduation. Our senior year is almost here, and will be so quickly finished. Looking back, the time has passed all too swiftly since we entered—young hopeful freshmen. Our vague yearnings have crystallized into practical ambition, aided by trained knowledge, which together have opened a new world to us. For this—for the good years spent in The Cooper Union, we thank our benefactor—Peter Cooper.



Top Row—Pierce, Haas, Ipsen, Merlin, Margolis, Danko, Ast. Middle Row—Okun, Kalemen, Constantinos, Washileski, Green, Adams, Schumann, A. Goldstein, Anders. Bottom Row—White, Rosovsky, Rosen, Lefeber, I. Goldstein, Daubaras, Schaefer.

DAY ART SCHOOL

CLASS OF 1937

October 1, 1933 saw the first onslaught by the class of 1937 upon the Day Art School, which hitherto was a school only for respectable (can't you see them?) young females. By October eighth, the entire class, after blushing momentarily in its first life period, and flinging handfuls of clay at each other, had been inducted into the mysteries of Creative Design.

The tempering process (a taking of a red-hot metal and plunging it into cold water—something to do with molecular rearrangement to make the metal tougher—ask an engineer) was begun a bit later when we were removed from our spheres of comfortable activity and plunged (à la tempering) into Union Square, where we had the opportunity of observing Nature in the "raw."

About this time it was suggested by the Student Council, who should have known better (Ed. Note—Yes, they should have), that we, the freshmen and freshwomen, organize and elect class officers. Wishing to savor every moment of the meetings, we spent our time in stump-speaking, debating, and mud-slinging, the harvest of which we have reaped in succeeding years.

Year two of our occupation found us with a cozy niche in the Pioneer where two of our classmates played tsars to picturedom, raising the unknown to inconceivable heights and dashing the famous to the depths from whence they sprang. (Ed. Note—They must have been cartoonists.)

Bassos, tenors, sopranos, and "unclassifieds" were assembled by one of our classmates in a motley throng from which emerged a "fair to middling" Glee Club whose stout voices gleefully ripped their way through a hymn and tore a spiritual to pieces.

Give us an inch and we take a mile! Expanding from a couple of cartoons per issue, we now have in the Pioneer a whole page devoted to the Art School.

Certain members of our astute body decided the world of the theater was definitely lost without them to grace the boards, so a Dramatic Club was formed this year. The offices of Chairman and Treasurer and the casts of the plays were peopled with a great majority of members of the class of 1937.

Hoping to prove as dextrous with the foils as with the brush (Oh, shades of D'Artagnan), we have formed a Fencing

Robert Gundlach
President
Allison Scott
Vice-president
Louis Donato
Secretary
Charles Randazzo
Treasurer

Club with our class represented on the governing board and Erica Hanka Gorecki as our instructress (what footwork!).

Besides tripping gaily the light fantastic at the oft-recurrent Tekart Dances, we also staged a Masquerade Party which we believe will be forever remembered but never duplicated until we again roll up our shirt sleeves and get to work on another. Said masque being such a huge success and consequently deserving comment we herewith give to posterity a detailed account of it. The date—December 19, 1935. The place—the sixth floor of the Foundation Building. Two painting rooms, colorfully decorated with original murals (à la Tony Sarg) by third year students, were the center of the festivities. These murals alone were worth the admission fee. Balloons, confetti, and crepe paper betrayed the feminine touch. Just to prove that they could cook, the girls supplied the tempting delicacies so essential to the success of any gathering where the stronger sex is present. After the entertainment, which consisted of a satirical comedy on the foibles of our elders, prizes were awarded to the wearers of the best costumes. Ruth Allen and Ben Ahneman were the winners.

Since 'All work and no play makes Jack a dull boy,' and since we found the converse is also true, we decided to get down to work and help to produce (in our small way) the 1936 CABLE. For the first time in Cooper Union history the Day Art School was invited to assist in compiling this volume. The majority of aspirants to places on the staff came from—you've guessed it—the class of 1937. It is with regret that we must admit, as the evidence exposes, that there are very few students in the remainder of the Day Art classes who are willing to give of their time to do something benefitting the student body as a whole.

And all this said (oh reader, dear reader) as if there was no work to be done other than extra-curricular work. Look ye and hark ye, at any of the exhibitions in and around The Cooper Union and there will you see (Ed. Note—If you look close enough) the class of 1937 copiously represented.

Top Row—Stanley, Woodcock, R. Allen, Fischl, Koeniger, Ahneman. Bottom Row—E. Allen, Scott, Gundlach, Mr. Purves, Gorecki, Kittle.

NIGHT SCHOOL OF ENGINEERING

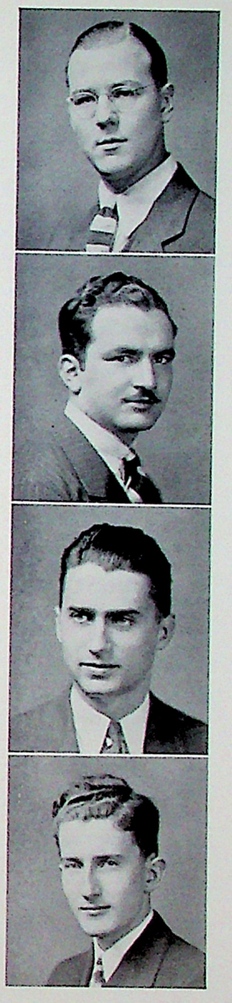
CLASS OF 1938

This, the class of 1938, forging ahead in the fourth year of its existence, has given its members a further and deeper insight into their respective fields.

This year marked the introduction of the students into the student chapters of the various engineering societies. Already they have been privileged with lectures by many outstanding engineers in the fields that they will ultimately enter. This year also marked the rebirth of the student chapter of the chemical society which had been discontinued for several years. The work of Mr. Gumbrecht and his associates deserves particular commendation. The Civil Engineering Chapter was fortunate in getting off to an early start and having many notable speakers acquaint the students with what they might expect to meet when they ultimately reach the stage of professional practice. Both the electrical and mechanical chapters have likewise contributed toward giving the students of the 1938 class a more complete picture of what these branches of engineering are like.

The class officers were elected early in the year and proceeded to outline an ambitious extra-curricular program. The various activities, however, did not seem to materialize because of the pressure of intense studying and the depleted ranks of the student body. However, since the Blanket Fee has provided access for every student to the Annual Dance and since the various student chapters of the professional societies have had their annual dinners, a certain amount of social contact was thus assured for the students.

So far as the courses are concerned, each of the sections is beginning to encounter the subjects which they believe constitute engineering. The advance surveying course particularly proved interesting and absorbing. That part of the course dealing with practical astronomy fascinated the section as a whole. The study of the stars, time, and the determining of the relative position on the earth from a siderial observation, were just a few of the pleasures they encountered. They were particularly fortunate in having the Hayden Planetarium, which opened just this year, to give them a more complete picture of what the subject matter was like. Such subjects as: Electrical Measurements, Electricity and Magnetism, Direct Current Machines, and Electrical Machine Laboratory provided many pleasures and headaches for the Electrical Engineering Section. Such



John Gumbrecht
President
Lester Roistacher
Vice-president
Herman Hornickel
Treasurer
Sanford Koretsky
Secretary

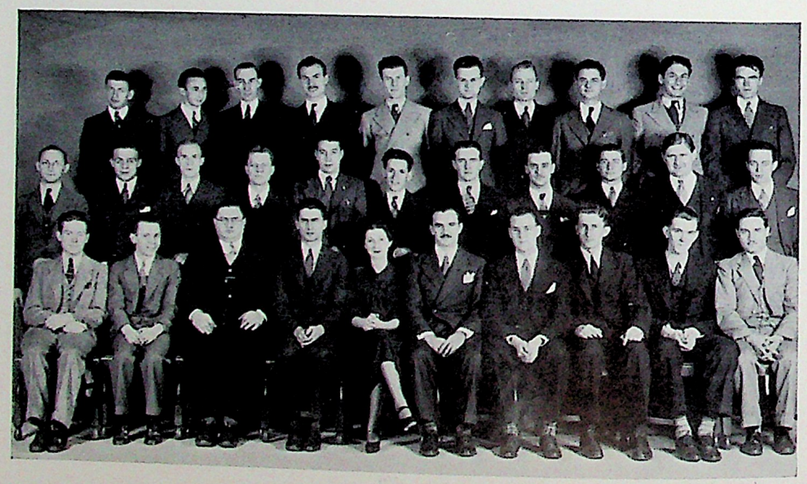
things as hysteresis, capacitances, inductance, dynamos, generators, and the study of many electrical devices assured this section of that which they long awaited. The Carnot principle, entropy, perfect gas equations, steam power plants, reciprocating steam engines, internal combustion engines, elementary and advanced machine design, took care of any "spare time" which the embryo Mechanical Engineers might otherwise have enjoyed. The Chemical Engineering Section was for the most part concerned with Physical Metallurgy. Of course, there were such other subjects as: Quantitative Analysis, Fuels and Combustion, Differential Equations; but these were only "tid-bits" so to speak, to spice the Metallurgy assignments.

Under the able instruction of humorous Professor Bacon, the four sections consoled each other on their various woes and gathered some lost sleep while studying the ever useful but not so difficult subject of Negotiable Instruments.

Word must be said of the very able instruction which helped pave the way over what might have been very rough going. The fourth year class, as a whole, is particularly grateful to their instructors who have indeed done their part.

Due to the pressure of business, coupled with the intensive study necessary to merit a degree in Engineering, it was almost impossible to devote any time to social activity during our first years at Cooper Union. In our third year, however, realizing the need of relaxation the Electrical Engineers and the Chemical Engineers under the able direction of John Gumbrecht, held a Beer Party and a Theatre Party, both of which met with the approval of all concerned.

Thus the class of 1938 looks very anxiously toward 1938. The intervening years seem as nothing—the years gone by, but yesterday. It will not be very long before the first representatives of the six year course make their bow before the profession.



Top Row—Wilensky, Welling, Kettleman, Alexanders, Tobey, Wizeman, Franz, Green, Shiller, Chichester. Middle Row—Bruckenthal, Reich, Ezell, Kozlowski, Sigman, Stauss, Vreeland, Del Papa, Levada, Fitzgerald, Oldham. Bottom Row—Barker, Schmutzler, Kaufman, Hornickel, Katz, Roistacher, Gumbrecht, Koretsky, Owendoff, Noss.

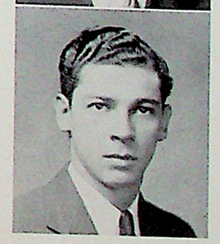
NIGHT SCHOOL OF ENGINEERING

CLASS OF 1939

The class of 1939 entered The Cooper Union three short years ago. Much water has passed under the bridge since then and very few of the "doing" men have won to the third year. Some fell by the road because of their positions, others were forced to surrender to relentless Fate because of sickness, and still others just gave up the "ghost."

At the class induction into The Cooper Union, the school weekly publication, The Pioneer, had been suspended for one year. A group of the freshmen, realizing the necessity for having some publication which would tell the new men something about the school and instil in them a spirit and a love for The Cooper Union, conceived the idea of publishing a class paper. Among this group were Charles A. Hauck and Elbert Jaudon, who have survived thus far to their third year. Their efforts culminated in a four-page, six by eight gossip sheet. The reading matter was brightened in many spots by cartoons drawn by the editor's girl friend and by his brother. The issue sold at two cents the copy and subscriptions were restricted to the class. The paper boasted a Peeping Tom column, short stories, sport activities, club and fraternal notices, puzzles, bits of science, and a column on the personalities of our instructors. Lest we forget, there also was an editorial column in which the members of the class were taken to task for this and for that failure. The sheet was so well-managed financially and so interestingly edited that, even to the surprise of the staff, a profit was realized. This was cheerfully submitted to the officers of the class to help defray the expenses of the class picture in the 1934 CABLE.

The men who promoted this small but interesting newsette have lived up to their abilities. This year, for the first time in the history of The Cooper Union, the men of the lower classes have been given the enormous task of publishing the CABLE for 1936. In former years, the Junior classes of the school published the CABLE. This year, in view of the fact that there are as yet no juniors in the six-year night engineering courses, Professor R. C. Brumfield, Chairman of Faculty Committee on Student Relations commissioned William P. Reuss, President of General Students Council for '34-'35, to select the editor-in-chief and business manager of the 1936 CABLE from the lower classes and to let these two men choose their staffs from any class in the



William Fitzpatrick
President

Charles Hauck
Vice-president

Frank Vanek
Secretary

William Joseph
Treasurer

school. Thus, it was only natural that the Council should choose the outstanding men of the lower classes for these positions: Charles Alan Hauck, Editor-in-Chief, and Philip E. Hagerty, Business Manager. P. E. Hagerty was one of the live wires of the class of 1939 but, because of the difficulties attendant to his position, was forced to take a leave of absence and hence is now in his second year.

These two men, Hauck and Hagerty, selected those whose abilities they knew and who were numbered therefore among their classmates: Walter Govertsen, though now a second-year man because of a serious illness, Elbert Jaudon, and Frank Vanek. These five men, the last of the "old guard," have published The 1936 CABLE.

During these two years the studies grew more difficult. Beginning with the "easy" courses of the first year such as Descriptive Geometry, College Algebra, Engineering Drawing, Chemistry, and the like, the students came through with flying colors. The second year "sat them back on their haunches." Now the tough work began. Second Year Chemistry, the bugaboo of many of the class was a mighty hill to climb. Add to this the courses in Analytical Geometry, Physics, and Social World the chances of getting passing grades look slim to an active man. However, because of diligent work, or is it perhaps, because of bribing the profs, most of the members were able to finish with clean slates. The third year was begun with optimistic spirits. But within a few weeks a wee bit of pessimism began to creep into the minds of the class. Who said the first two years are the hardest? Electricity and Magnetism, Calculus, Trade and Contracts, Engineering Mechanics, Analytical Chemistry, Surveying, and Kinematics assumed giant proportions. According to all reports thus far received, the majority of the members are keeping their heads above water. The final exams will tell the tale of success or failure.

The social activities of the class of 1939 had been varied but successful. In the freshman year the first affair was a stag dinner, held on Friday night after school

Top Row—Rankel, Brady, Budde, Middleton, Kertescz. Middle Row—Martone, Winer, Evans, Fleit, Guzzardi, Weber, Hasselbach. Bottom Row—Border, Wolejsio, Michaels, Hauck, Keiserman, Balk, Marchetti.

hours. An extremely large percentage of the class attended, together with their instructors. As a matter of fact, before the dinner was half over, a keen rivalry was in progress between the members of the faculty and the students as to which group could put away the greatest amount per man of that good old 2.5 alky. (Ed. Note —We never found out who won the contest. All our questions as to the outcome were met with archful smiles and knowing looks). Entertainment was provided in the forms of dancers (male), crooners, jesters, and last but not least, one of those people seldom heard and never seen, a real, honest to gosh, pianist. All the gang had a jolly "uproarious" time and when the keg(s) were drained, staggered home in a "Sweet Adeline" mood.

The success of this affair paved the way for another at the end of the year. Argument waged back and forth, the benedicts versus the bachelors—"Should it be stag or co-ed?" The bachelors triumphed and a committee headed by Govertsen staged a boat-ride to Indian Point. (Ed. Note to Business Manager—Can we get something from the Hudson River Day Line for this publicity?) Entertainment (there was none on the boat—it was co-ed) was presented in the form of athletic contests topped by a baseball game of, again, "Bachelors versus Benedicts." This last contest was featured by wagers between the wives and the girl friends. The bachelors, fearing to place greater financial burdens upon the overloaded backs of the benedicts, allowed the married men to tie the score and, finding a technicality, called the game a draw, gathered up their bags, cameras, and their women and wended homeward.

The opening of the next year at school saw the re-installation of the Pioneer and the election of an entirely new set of class officers. These new officers unlike those of the first year did not have that "git up and go" quality. Consequently, there were no social activities scheduled for the ensuing year. However, the old group

Top Row—Keaveny, Tobias, Somson, Kessler, Frascella. Middle Row—Vanek, Miller, Michaelson, Klein, Hutchins, Bricchi. Bottom Row—Glass, Burch, Berman, Barack, Danner.

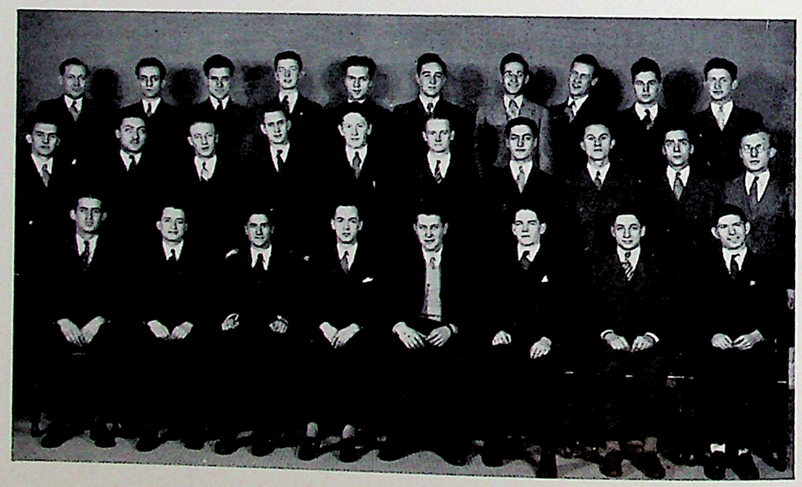
met and formed themselves into a bowling team and challenged any other class team in the school. Ten contests were held, our class winning seven of the ten matches.

Toward the end of the year, this same group began to persuade the class officers: Albert Ossi, William Charney, Bill Fischer, and Mark Kusevich, to hold some affair at the close of the school year. After a great deal of coaxing, and even bullying, another boat-ride was scheduled for Indian Point. The class of 1940 was also invited. Athletic contests were again the entertainment, and the baseball game was "Soph versus Frosh," which, of course, the Sophs won by a good margin.

The third year saw the division of the class into the four engineering courses, and the separation of chums who could not see eye to eye regarding which engineering field offered the most satisfaction and the most "lucre." Thus the only means of seeing these old friends were through either fraternities or through social gatherings. The class officers chosen at the beginning of the year, namely: William Fitzpatrick, Charles A. Hauck, Anthony Pinto and William Joseph, had planned two social functions for the year. One, a dance during the Spring vacation, and the other, an outing the first Sunday after the closing of school. The dance was attended by more than fifty percent of the class, proving that the spirit shown in the first year was still in existence. This affair, a social and financial success, was acclaimed as the jolliest gathering ever held by the class of 1939.

The plans for the outing are held in abeyance though let us hope not for long. The class is eagerly looking forward to a bigger and better time than ever before.

The success of the various social functions in the last few years demonstrate the spirit of cooperation existent in the class of 1939. This should give a fair omen of the result of the proposed outing, the plans for which are still in embryo. Nevertheless, all the members of the class are eagerly looking forward to a bigger and better affair than ever before.



Top Row—Adams, Sobel, Simeone, Walsh, Roszkowski, Haar, Charney, MacWhorter, Wiesendanger, Luther. Middle Row—Fristensky, Sonberg, Heiser, Brown, Woebcke, Bahrenburg, Volk, Dravesky, Marino, Lieber. Bottom Row—Wasserman, Dworkowitz, Atkins, Fitzpatrick, Barrows, Jaudon, Koliner, Goldberg.

INSTITUTE OF TECHNOLOGY

CLASS OF 1938

We entered The Cooper Union in September 1934, a hopeful group of freshmen, most of us just out of high school and still cherishing memories of our senior year in high. Like the majority of those who come to learn at The Cooper Union, we were taken aback by the new and severe curriculum. Social activities were not so important as we had imagined, and for the most part, we held our breath and sat tight—and studied a whole lot. It dawned upon us why Cooper engineers are in such high repute in the profession — one has to be good to get his degree.

After the results of the first year's final examinations were announced and the new class lists were posted, we found that our ranks had been sadly depleted. In most cases it seemed we had lost the most cheerful and optimistic members of our freshman days and those with whom we had formed the warmest friendship. We sincerely hope they will retain that optimism and cheerfulness in spite of their temporary defeat and that next year will find them still pursuing their courses at Cooper. The loss of friends and classmates did not have any great effect upon those who had attained the exalted rank of sophomore, for the second year found us separated into the various engineering departments with new friendships and new rivalries soon formed. As usual, the Chemical Engineering Department garnered the lion's share of the class with the Electrical Engineering Department a fairly strong second. In comparison with the horde of Chemical Engineers, the few Civil and Mechanical Engineers seemed like a few lost souls in a vast wilderness. What these two departments lacked in numbers, however, they made up in other accomplishments.

Although we were all thankful that we had escaped the bugaboo of descriptive geometry and English themes we soon found that our second year courses were likely to cause a good deal of trouble. The Civil Engineers, those "rugged outdoor individuals," to quote Dean Bateman, dreaded a rainy Friday afternoon with its possibility of a long quiz instead of the customary four hours of field work; the Chemical Engineers were always groaning about their Inorganic Chemistry problems; the Mechanical Engineers had Kinematics of Machines to worry about; and the Electrical Engineers had to write pages upon pages of Electrical Measurements Laboratory reports. Naturally, each section

Max Strauss
President

Sol Tannenbaum
Vice-president

Robert Hammond
Secretary

George Landow
Treasurer

tried to convince the others that it had the most difficult courses. This led to several rather heated debates and fostered a worthwhile rivalry among the four engineering branches. All of us with no previous knowledge of German found this course one of our chief obstacles. The rapidity with which the classes advanced made it imperative that the students kept up to the minute with their assignments. Trade and Accounting problems gave headaches to us all. Many weary hours were spent finding mistakes which, although they should not have been made in the first place, were none the less difficult to find. The course in Professional Aspects proved a welcome innovation. From the series of lectures and motion pictures which it included, we obtained a fairly definite idea of the type of problem which each branch of engineering attempts to solve, of the methods of solution, and of the dependence of each branch upon the others.

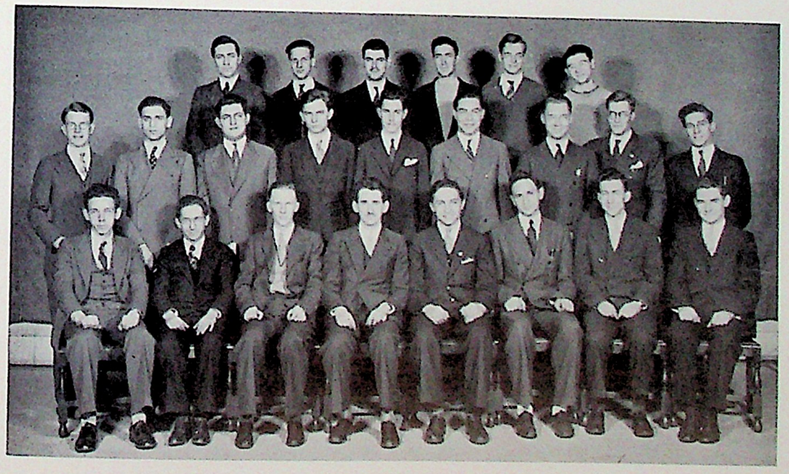
As a class our first move was to become organized. With this purpose in mind a business meeting was held and the following class officers were elected: President, Max Strauss; Vice-president, Sol Tannenbaum; Secretary, Robert Hammond; Treasurer, George Landow. A dance and several other social events have been suggested but no definite plans have been made. It is expected that these plans will be decided upon in the near future.

We believe we have shown a more than average interest in the extra-curricular activities at Cooper. Last year we endorsed the Blanket Fee with little or no hesitation and so far this year very few of us have failed to pay the Blanket Fee assessment. During the past year we engaged in inter-class sports at the Christadora House and this year, because of the increased attendance in the gym and pool, we intend to accomplish much more. To date, we have supported and helped to make a success of the Tekart dances. Several members of our class are members of the Pioneer News Board. The same can be said for the manager of the basketball team and for one of its regular players. We have also shown interest in the activities of the student engineering societies. This interest has been stimulated in the case of the Civil Engineers by the fact that the American Society of Civil Engineers has invited Sophomores of the Institute of Technology to join its ranks for the first time in its history. Membership in this society, previously open only to Juniors and Seniors, has been opened to second year men in the belief that the increased membership will cause a corresponding increase in the number and interest of the meetings.

Up to the present time, the subjects which we have considered are of an elementary nature (though so very difficult for us mere youngsters). However, these same subjects form the foundation upon which is based the entire structure of the science of engineering. Now that we are actually studying the theorems from which our courses are evolved, it is extremely desirable that we gain a genuine practical knowledge of the use of these fundamental principles in real work in the technical fields. It became part of the function of the aforementioned societies to dissect some of these essential theories which we have been taught and show us from plain concrete facts how little they are used in industrial practice. However, let it not be wrongly supposed that this activity was the chief aim of these societies, for their main objective was to clarify Engineering, our chosen profession. This they have done faithfully and excellently, and for their work in this respect we are deeply grateful.

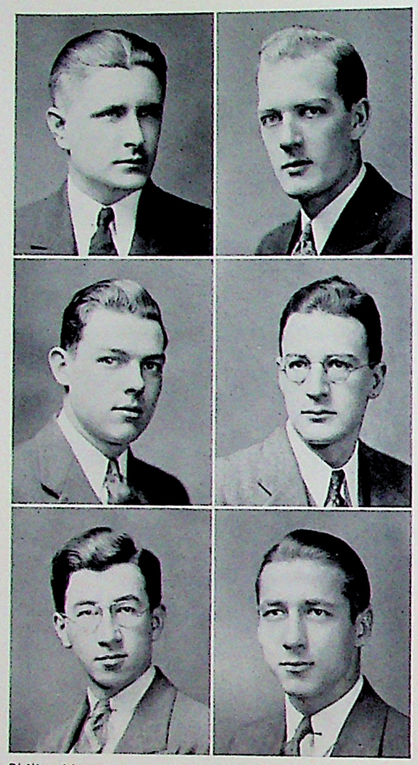
We still have the better part of our course ahead of us, and for many who will certainly do advanced work, we have made but a beginning in our education. In the remaining years, it will be well for us to cement those friendships which we are now forming, so that when our courses at Cooper Union are completed, we may enjoy social happiness coupled with professional success.

Top Row—Kerstein, Kenny, Dunkelman, Gruol, Plotkin, Dohn, Goldman, Goodman. Middle Row—Lenter, Loughlin, Lipschitz, Sanders, Weber, Lang, Knopfle, Eiwen, Bodzin, Agin, Slotkin. Bottom Row—Auerbach, Ozsvath, Tanenbaum, Strauss, Hammond, Samberg, Sagonas, Herman.



Top Row—Koosman, Purr, Levigton, Weixel, Egbert, Zernow. Middle Row—Tucker, Thomas, Iskowitz, Kordak, Rennolds, Borden, Duch, Hahn, Dury. Bottom Row—Kandiner, Weintraub, Miller, Landaw, Richmond, Leventhal, Siesholtz, McLaren.

CLASS OF 1940



Philip Hagerty
President
William Neary
Treasurer
S. Rabinowitz
Ass't Treasurer

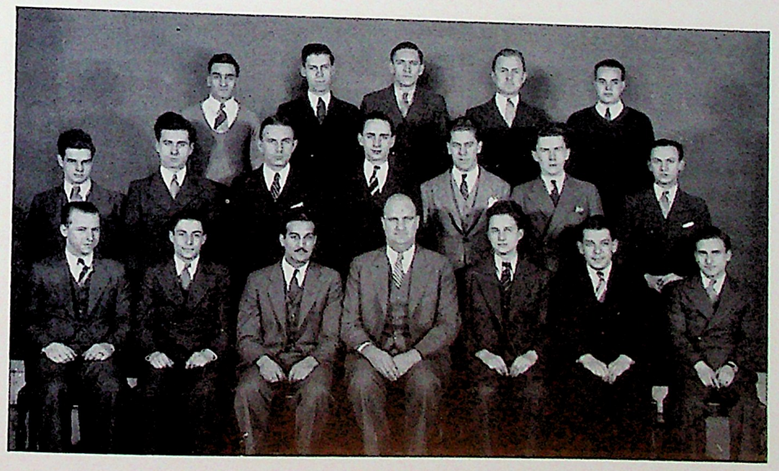
Walter Govertsen
Vice-president
Moe Cammer
Secretary
Alphonse Skorski
2nd Vice-president

The Class of 1940 has been a seriously minded class. The business of obtaining an education has been uppermost in its collective mind most of these past two years. There has been little time for much frivolity or for much of that easy-going camaraderie that is supposed to be a traditional part of college life. We have felt this loss keenly—would that Father Time would turn back the clock! However, it has been a case of the spirit being willing and the flesh being too tired. Our freshman year was spent in comparative obscurity. Each of us went his separate way, the burden of scholastic work keeping our noses to the grindstone. At the close of our first year the need for closer cooperation and a more friendly companionship became evident. Those first year exams made this a foregone conclusion! Came September—and our class had shrunk in the aggregate and grown individually. The backs of our flapping ears being dried and our ego being tapered off to what for us is an absolute minimum, we plunge into student affairs—"con mucho gusto." Class elections were more spirited than last year because now we were wise—we knew who worked and who shirked. Our officers found that regular weekly meetings of the executive committee resulted in "getting things done." That hard to define expression "college spirit" is slowly but surely growing on us. We are being transformed from college boys to college men—from Cooper novitiates to Cooper exemplars.

Food and drink being a necessary and vital part of life and we young bloods being anxious to partake of life, our crafty minds concocted a scandalous scheme, a Bacchanalian adventure—in short, a rendezvous with Pilsner! By consultation with the Oracle, it was decided that the first Wednesday of the twelfth month would be propitious (opportune to you). As an appropriate den of iniquity, we chose Nicholaus', an otherwise respectable "joint" on Second Avenue. The attendance was overwhelming—well, not too overwhelming. The whole affair being under the joint sponsorship of the Classes of 1940 and 1941, our little freshman brothers were well represented. The amber nectar flowed and the dainty morsels called sandwiches disappeared with alarming rapidity. Comrade Cammer was run bowlegged trying to find out how many pitchers of ale constitute a barrel of beer. Credit is due Moe for the successful functioning of his one-man committee on entertainment. Among our honored guests were Professor Ray C. Brumfield, Messrs. Tanzola, Currey, Halsey, Lehman, and Sheridan. We listened very attentively to their words of praise and encouragement and tried to conceal our blushes. We appreciate the friendly interest taken in us by our instructors and take this opportunity to thank them. A feature attraction of our program was an exhibtion of sleight-of-hand and legerdemain by one Douglas Geoffrey, who took pains to make our wise guys feel foolish before their public. This joyous gathering passed into history in the wee sma' hours of Thursday. We earnestly hope that this friendly type of gathering will become a permanent part of our scholastic existence.

Looking back, retrospectively, memories flash before the mind—it were as though we were focussing a spotlight into the dim regions of time that has passed. The spotlight shifts this way and that—lighting hidden vistas of two years' memories—here bringing into bold relief a familiar face—there revivifying a picture of a long-forgotten name—casting shadows of reflection—drawing delicate silhouettes for future reminiscences. The spotlight shows all—the men who crammed—who cribbed—who survived.

At this point in our story we pause to introduce some of our pious friends and notorious companions—Phil Hagerty, our president—diplomat and business man. Howard Andersen, our first president—some two hundred pounds of good nature—coupled with mild bewilderment over the mysteries of higher education. The O.K. corporation of Frank Castellano and Mike Aquino—who inspire each other so that

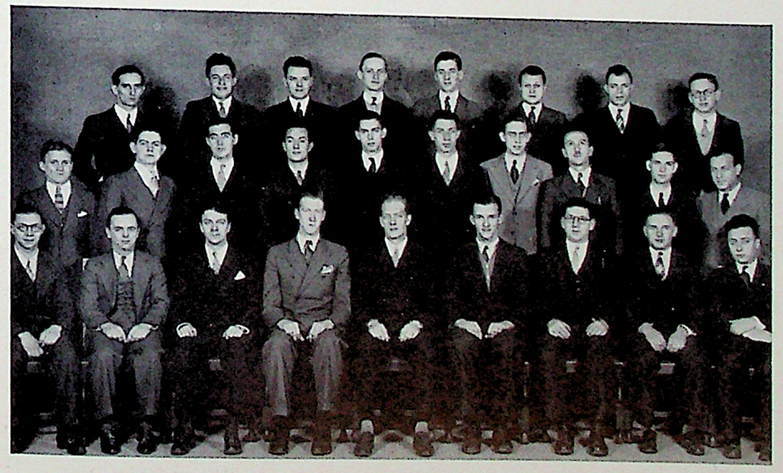


Top Row—Di Monico, Brooks, Wexler, Bachstetter, Zucchino. Middle Row—Colen Chudow, Braselmann, Hoban, Carlson, Cole, C. Bernstein. Bottom Row—Jehle, Adler, Castellano Anderson, S. Bernstein, Cohen, Berger.

neither ever flunked a quiz. Bill Neary--who developed the game of stud poker to an exact science, and who is the best treasurer of whom we know. Sol Bernstein—who left in his wake many precious memories of adolescence. Tom Bucciarelli—of whom a one-word description might be—truculent. George Quinn—who hankers for more culture in Cooper. Walter Govertsen—golden-haired and golden-voiced—the super salesman of the class—a leader and a friend. Harry Roistacher who proved to be a perfect companion—and interposed a gently reserved conceit as a barrier against the cruder onslaughts of the hoi polloi. George Carlson—happy-go-lucky gooch—always ready to have a beer with any one. Harold Parsekian—who grubbed countless cigarettes—but who was a lot of fun. Bill Cole—a natural showman—who aimed to please and succeeded. Ike Rabinowitz—a corking fellow but a terrible pinochle player. Georgie Grebert, whittler and business man—who could sell tickets to an old ladies' afternoon tea. Eddie Hofmann—vigorous of speech and of arm-waving. "Clat" Nelson—a chap who combines a jovial camaraderie with just the correct amount of circumspect reserve. "Heck" Zucchino—a boy whose treatment of girls was governed by scruples. Leo Bachstetter—a perfect example of what a moustache and the Coué method persistently applied can do for a man with ambition. "Rog" McAlister—a scholar, a Scotsman, and a gentleman combined in one. Saul Birnbaum—a living personification of the failings of our educational system. Moe Cammer—who can tell ribald stories or recall Shakespeare with equal facility. Nat Rochlin—who sings, draws, and dresses well. Walt Hommes—quiet, unassuming, capable—we wonder what goes on behind that innocent expression. Ira Cohen—he knows his stuff—who'd guess it by looking at him? Sidney Aspler—whose note books saved more lives than we know. Vince De Sanctis—who owns a very nice smile. Hymie Adler—the little fellow who takes himself so terribly seriously. Andy Rosenberg—with the look of disillusioned Broadway in his eyes--we don't know what

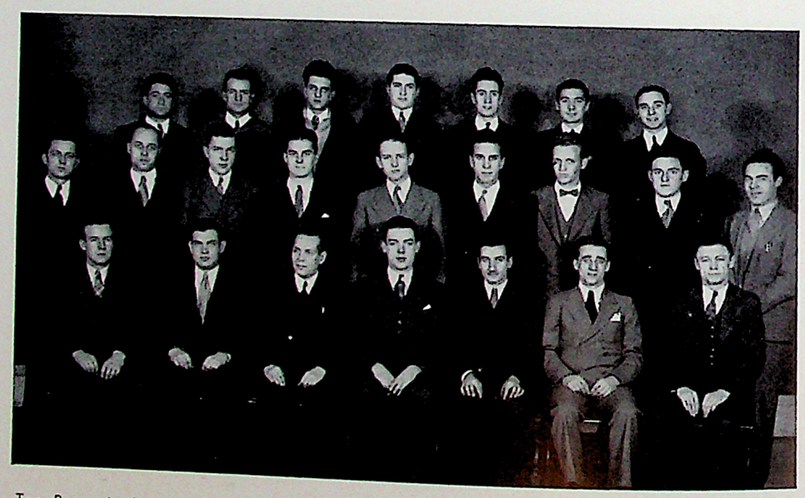
Top Row—Fuchs, Garfinkel, Kahn, Goldberg, Dworkowitz, Eckel, Dunay. Middle Row—Gilman, Drechsler, Yesowitch, Foust, Gebrian, Kunysz, Feldman, Frisch. Bottom Row—Niechwiadowicz, Docke, Fleck, Hagerty, DuFlon, Gilbert, Friedman.

marred his past—but the future still beckons. Al Skorski—whose idea of heaven would be an immense basketball court. Constantino Dubac—empty barrels make the most noise. Frank Hoban—than whom there is no sleepier—nor friendlier. Gilbert and DuFlon—the Siamese twins. Oscar Frisch—always lost in meditation. Sid Garfinkel—always ready to argue with a Prof. Julie Goldberg—a figure of imposing dignity. Moe Hashmall—the ideal milkman. Bill Haratonik—willing to tell you everything about anything if you have the time. Ernie Lindner—who'll go anyplace, anytime, if promised excitement. Frank McGinnis—athlete and ladies' man. Irving Moskowitz—who somehow knows all the answers. Tom Trayner—who gets in peoples' hair without half trying. Ed Walsh—a hero to his valet. Bill Fischer—a recognized authority on wine, women, and song. George Kent—who insists he was disillusioned before our time. Dan Mahoney—who thinks that Ireland is a suburb of Paradise. Theresa Tarzanin—who plans to add that feminine touch to such manly pastimes as bridge-building and ditch-digging. Paul Vestigo—friend and savant—an exponent of the finer things in life. Jack Sonberg—who it seems has lost his Cooper spirit. Norb Mullio—who is enamored of mathematical philosophy. Gene Patrone—a philosopher in engineering. Harry Goode—wise beyond his years and much given to expounding abstract mathematics. Arty Paulsen—says little, knows plenty. Henry Perez—he of the cool sang-froid. Vince Petrucelly—doesn't let you know how much he knows. Sam Rabinowitz—harried shepherd of a flock of ungracious classmates. Charlie Pinto—who knows his way around. A. Braselmann—who comes to us from the fair city of Hoboken. Vic Dobler—who chances the vicissitudes of the Staten Island ferries, so great is his thirst after knowledge. Steve Girnius—forever grinning—about what? Tom Gilbert—who loves his alma mater so much that he commutes from Maplewood, N. J. Willy Pfann—the astute oracle of Juniper



Top Row—Kalifon, Goldman, Dobler, Gurnisiewicz, Weinhofer, Hofmann, Larkin, Krulewitz. Middle Row—Bartelheim, Kaufman, Stern, Plotkin, Kryger, Schroeder, Koehler, Greenberg, Hampton, De Sanctis. Bottom Row—Gormezano, Strom, Meringer, Gerbert, Govertsen, Grohse, Hashmall, Krukiel, Scozzari.

Road, Middle Village, L. I. Isadore Rabinowitz—who should be a great man with the ladies, for if he weren't so tall, and looked different (much different), and were man enough to grow a real mustache, would really resemble Clark Gable. Johnny Posavetz—wonder why he's so quiet? Still water runs deep—so they say. Leo Plotkin —seems to draw on a vast store of knowledge—the oracle of Delphi and the Voice of Experience must be plagiarizing his line. Bob Carr—nobody would suspect that he's a furriner from Elizabeth, N. J. Bill Rosenwald—wonder what happened to the eyebrow he shaved off his lip just before Christmas? Maybe the girl friend didn't like it—and then again, maybe she was tickled with it. Lester Kryger— whose presence is ample proof of how widespread is the fame of our beloved alma mater, for (didntcha know it?) he's an outlander from the wilds of Hawthorne, N. J. Will Foust —wonder how much Mephistopheles paid him? Paul Kunysz—if he spelled his name backwards he'd have a swell chance to be last in the phone book, so some fool could wake him up just before dawn. Lester Levine—who has very little to do with the "hail-fellow-well-met" spirit in Cooper, through no fault of his own. Solomon Lubin —an example of the small town boy's making good in the big city—only his home town is far, far away. You guess where. Walter and John Mihalik—who come from Clifton, N. J., to learn the gentle art of throwing bridges across rivers as well as smashing atoms (yes, they are brothers). Joseph Pearlstein—a man of the world—who came back for more after once succeeding in getting out of Cooper—(Didja know he's attending two other night schools besides Cooper and holding down a responsible job in the day?—Wotta man). Jerome Schnall—you wouldn't think such a nice fellow makes pansies. He does (but not the kind you think) in an artificial flower shop. Ed Grohse—who swears that he still believes in Santa Claus (nobody doubts it). Arty Poole—who once tried his hand at politics but evidently found it not to his liking. Arty Conklin takes everything in his stride. Docke—the handsome



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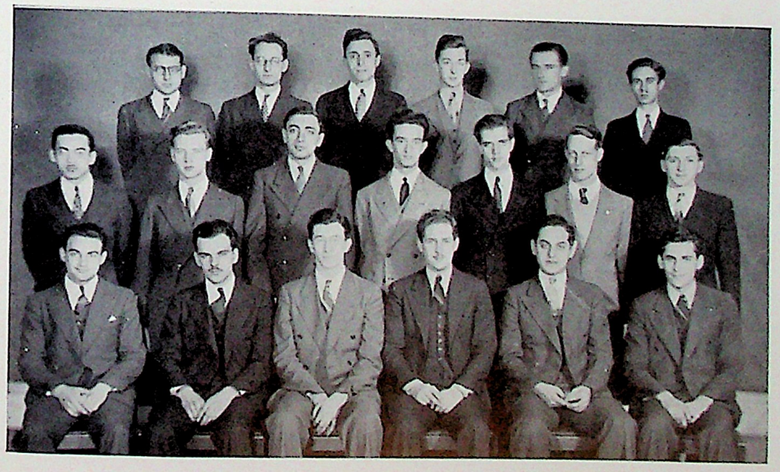
Johnny of our class. Joe Friedman—the guy who can't make his haircomb behave. Abe Dworkowitz—poker face, the guy who never smiles. Sam Gilman—the learned one, always willing to help a classmate. George Gebrian—a man serious beyond his years. Dapper Dave Feldman—a boon to the men's furnishing industry. Al Smith—who "takes a walk," regularly from Lyndhurst. Sam Kalifon—ambitious, conscientious, and friendly. Bob Schumacher—a Long Island dirt farmer (do you know any farmer's daughters, Bob?). Ed Krukiel—his name is hard to spell, but his acquaintance is worth marking. Barney Strom—try to talk him out of his ideas. Fred Drechsler—who had a hard job convincing us he is married. Greenberg—star gazer extraordinary, have you seen him? Reggie Brooks—raconteur and wit. Ed Jehle—a mysterious fellow, who will talk about everything but himself. Jack Fuchs—everybody loves a fat man, and why not? Bill Hampton—sunny Bill from Sunnyside. Lasky—always in a hurry but never on time (ask any Prof, about him). Charlie Leys—we thought he was instructor the first time we saw him.

Of course, we sterling flowers of young manhood did not come unassisted along the non-too-smooth road to higher learning. Our innate modesty wouldst perforce have us point out—and commend for their perseverance—those among our noble faculty who have been most instrumental in developing our inherent capabilities. Professor Enders—small and dynamic—senior member of the faculty and still as young as any of us in spirit. Professor Ball—a teacher of rare human insight (he makes us feel uncomfortable, sometimes) and whose ability as an instructor makes easy the appreciation of physics. Mr. Donald McLean—that delightful raconteur who expounds equally well on the foibles of the great and the logic of analyt. Mr. Otto Puller—an able draftsman sore beset by chemical engineers who try to learn what he means by "tolerance" and "necking"—(not that kind). Mr. Ray Syzmanowitz—a Cooper old-grad, whose eyes can see through any wool pulled over them. Mr.



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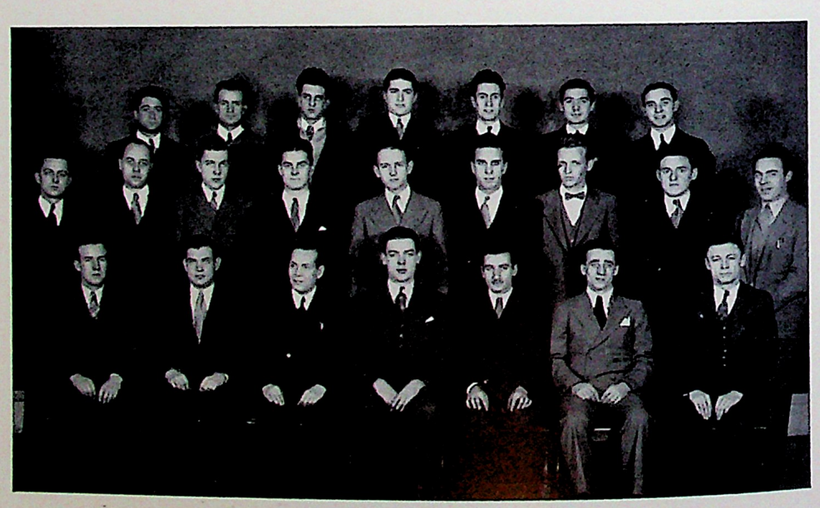

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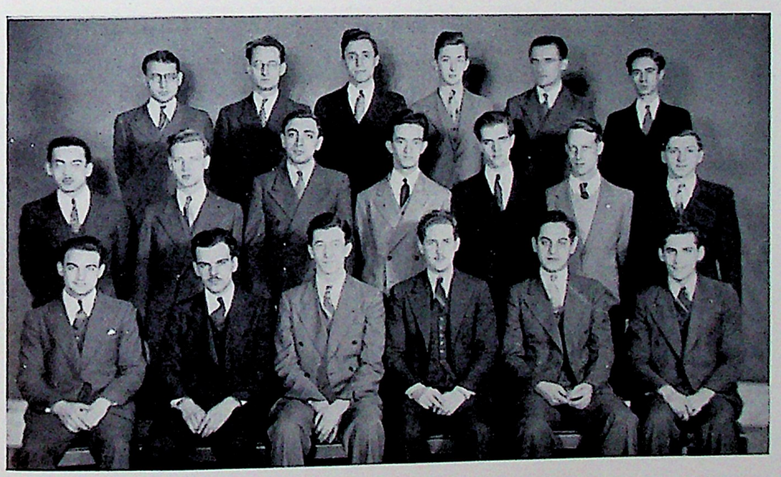

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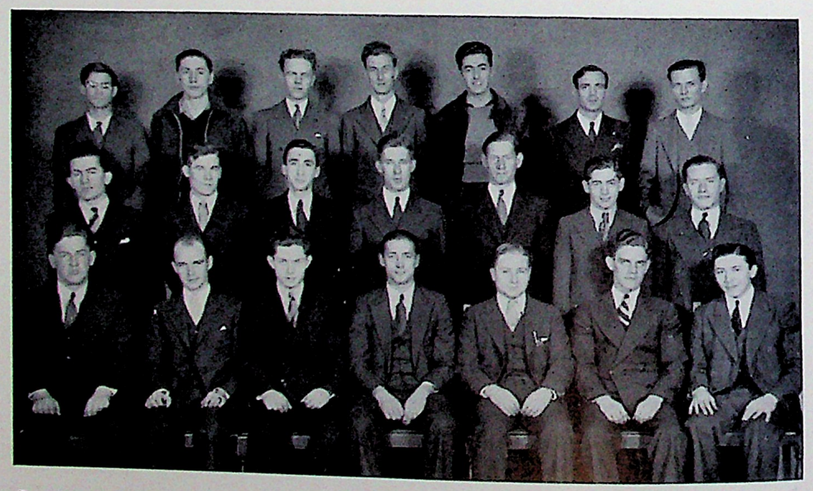
Herman Stemper—knows all the short-cuts in physics experiments. Mr. Sheridan—works hard to drag an indifferent class through the exams. Mr. Kenneth Lofgren—who attributes his youthful ability to "take it" to many years of climbing upstairs to the top floor while a student and teacher at Cooper. Mr. Hugh Halsey—takes student stupidity pretty seriously, and is annoyed at the lightness with which they treat such matters—his good nature, which he does his best to hide keeps him from exploding at recalcitrant classes. Mr. Taplin—the imperturbable, whose coolness is perhaps the basis of his painless teaching of mathematics. Mr. Salmonsen—doesn't talk much, but knows his subject so well that he can teach even us. Mr. Mantz—whose native ability to slice it thin and lay it on thick adds no little interest to the vagaries of the Social Whirl, and who is a crackerjack philosopher to boot. Mr. Burns—doing a good job of a thankless task, teaching physics to Cooper men. Mr. Tanzola—who knows his math, and can put it over by reason of his matchless ability to bulldoze the studes. Mr. Faralla—small, but the aspiring physicists look up to him. Mr. Hope—how can such a youngster know so much? Mr. Summers—so much a regular fellow and one of us that on occasion young hopefuls have tried to borrow homework from him—and so nonchalant that it's hard to realize that he's the tops in chemical engineering. Mr. Tarr—another one of the pleasanter instructors who knows his chemistry to a near perfection and presents it in such a way as to eliminate the complex problems in Pitré.

So time moves on, and we approach the close of our second year. We have got to know each other much better than we did, and friendship springs from knowledge. During the four years to come, let us make faster the ties of friendship which exist among us, and let our division, next year, into four distinct classes, not give rise to section loyalty, but let it, rather, by means of the intimacy of its sections, serve to increase our knowledge of one another, and so foster a lasting feeling of friendship among us.



Top Row—Lasky, Zinberg, Walsh, Smith, Zalinsky, Yeager, Champe. Middle Row—Tamezian, Scott, Sherman, Osciak, Wield, Wolk, Schmer. Bottom Row—Wagner, Fischer, Pancsofar, Skorski, Stahl, Walker, Silverman.

INSTITUTE OF TECHNOLOGY

CLASS OF 1939

On September 18th, Dean Bateman welcomed to The Cooper Union what we believe to be the finest freshman class to pass an entrance examination. One hundred honor students, representing the pick of eight hundred applicants—and every man realizing it. Puffed up with pride and self-esteem, we felt fully able to conquer anything in Cooper Union—even seven flights of stairs.

We ambitious young men were not kept waiting. In the first week every man received more assignments than a mid-term exam had brought him in high school. Analytics, descript, physics, and drawing pyramided into a solid structure of resistance. However, our ego remained intact until the first week in October. The initial batch of Physics Lab Reports were then returned. Dante Accino was the only man to have an experiment accepted—the Vernier Caliper at that.

It is with real pride that we look back at these difficulties and smile. Scholastically, we have done all that our high school records promised.

Occasionally, every college is cursed with an inactive and non-cooperative class. Our class is decidedly not one of these. We entered enthusiastically into all branches of extra-curricular activity. On September 26th we endorsed the Blanket Fee, not half-heartedly, but with a unanimous vote.

In mid-November the Freshman Council was organized. Each section chose two representatives. From this group of eight the four officers were elected. The remaining four representatives, Hyman Lacoff, Harold Feder, Walter E. Roth, and Ray Bendett, served throughout the year as section delegates, having votes in all decisions.

The Cooper Union fraternities pledged many freshmen early in the fall. The pledgees' pool table debut was rather funny. In many cases the objective seemed to be "to sink the cue ball." We Frosh are grateful to the fraters for welcoming us so warmly and helping us in so many ways.

The Freshman Class has been as active in athletics as in everything else. Ten of us volunteered for the basketball squad. Of this group, we remember Walt Baumstein as the star—and as the man who won the Pioneer Score Guessing Contest. Dave Horowitz was chosen as assistant manager of the Varsity Squad, Harold Donnelly as manager of

Robert Brown — President
Richard Miller — Vice-president
David Horowitz — Secretary
Harry Robbins — Treasurer

the Class Basketball Team, and Dick Miller as Class Swimming and Water Polo Manager.

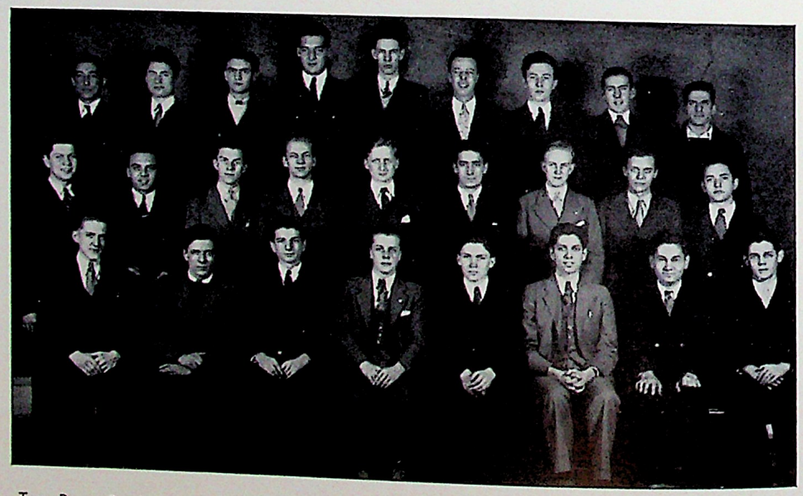
Theodore Berlin, Robert Herzog, and Royes Salmon are remembered as those who first brought our class to the front in the field of extra-curricular activity. Of all the chess experts of Cooper Union, faculty and student alike, these three were the only ones to play to a draw Morton Hemmermesh, Eastern Chess Champion. All other entries in the simultaneous matches were defeated by the intercollegiate expert. When the Tech men organized a chess team to play the Night School on October 22nd, these freshmen won three of the four victories that secured the match for the Day School.

Hal Hessing and Bob Brown represented the class on the Tekart Dance Committee. Although many Frosh are not exactly Fred Astaires, a large group attended the dances regularly. Those who could not dance made brave attempts. Several even attended the Fifty-third Street "Y" dance classes. Through the influence of these dances, the Art School became our rendezvous. We certainly liked the parties held there.

Our class is well represented on the Pioneer staff. Early in the year the Pioneer called for reporters, writers, and proof readers. The largest response came from the freshmen. Jim Allaire, Irving Dreskin, Bob Brown, Frank Quattlander, Harry Robbins, and George Rolly did good work on the news and production staff throughout the year. We expect to see some of them in staff positions next Fall.

A class survey by the Pioneer revealed that ambition was our dominant trait. For a time many were rather skeptical, but our discovery of Charles Prinzka has convinced us. Charles has actually memorized the three place table of logarithms. A chap with that much ambition certainly makes up for the rest of us.

Although our class is not eligible for the professional societies, we have received



Top Row—Brody, Centre, Elovitz, Blitz, Berlin, Baumstein, Chaite, Allaire, Accinno. Middle Row—Bastian, Berte, Bratt, Bendett, Aronow, Caligiuri, Everson, Dunefsky, Brooks. Bottom Row—Donnelly, De Simone, Dreskin, Brown, Denenholz, Caccamo, Kramer, Dege.

the benefit of many interesting semi-technical discussions given by prominent engineers. In addition to these, there were many absorbing talks given by Professor Everett Dean Martin on Social Philosophy. These lectures have given us a new perspective toward the many activities going on about us. This modification of attitude towards surrounding events is probably the most notable change we have undergone.

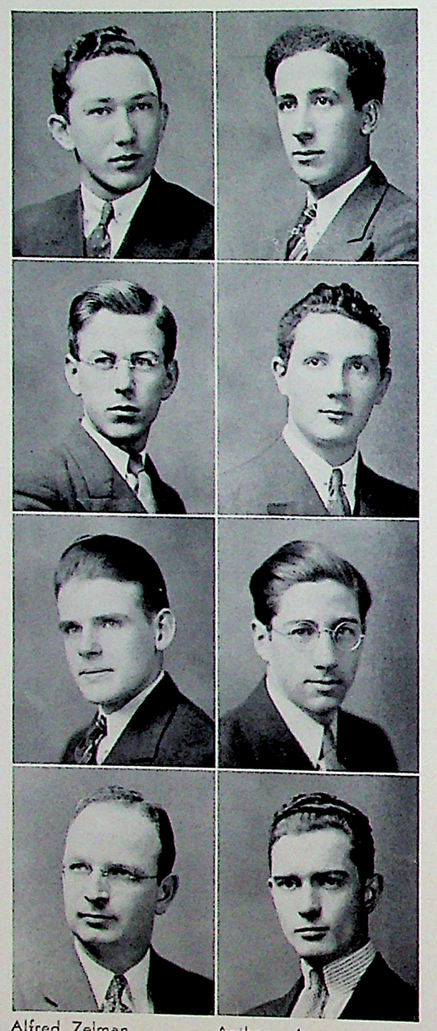
As a group the freshmen have succeeded. We have met and conquered our difficulties. We have entered into all fields of extra-curricular activity and have done creditable work. Looking backward, we can say that we really enjoyed our first year at Cooper. Mr. Lehman's quips, Professor Ball's brilliant showmanship, Professor Merritt's subtle humor—all have helped to make our classes less tedious. A pleasant spirit of camaraderie has been maintained throughout the year. If we never returned to Cooper, it would be some time before we completely forgot each other. Class characters—irrepressible Irving Centre, the towering good-natured bulk of Charlie Blitz, laughing Frank Janos, the lanky genius, Theodore Berlin—will be long remembered. With true pride we can say that we leave a bright and pleasant class history behind us.

Before us lies a future that we hope will be even brighter. We face three more years at Cooper Union. Nearly half of the class has elected to study chemical engineering. About one-fourth has decided upon electrical engineering. The remainder is about equally divided between the fields of mechanical and civil engineering.

Our work has been hard at times. We, the freshmen, should like to express our sincere gratitude to our friends among the faculty and upper classmen who have helped us over the tough spots. We hope that we shall retain their friendship throughout our Cooper Union career and beyond.

Top Row—Rolly, Quattlander, Salmon, Russ, Pratt, Geier, Fegan, Fitzgerald, Koroshetz. Middle Row—Quinn, Peters, Stone, Serveson, Weixel, Feder, Holland, Goldstein, Gluck. Bottom Row—Farmer, Schwartz, Kozmik, Roth, Schaffer, Robbins, Ferreri, Foodim, Miller.

CLASS OF 1941



Alfred Zelman
President

Fred Hamel
Vice-president

Edgar Budden
2nd Vice-president

Harry Weil
Ass't Treasurer

Anthony Ancona
Treasurer

Sidney Deutsch
Secretary

Martin Plum
3rd Vice-president

Robert Wood
Historian

It was late August, and The Cooper Union Auditorium was crowded with anxious, perspiring men. Each of them was handed a heavy cardboard and some paper. From some of these cardboards, roughly sketched faces of lads and lasses grinned and grimaced at them. I recall one excited young man who sought to change, for another, his card on which had been drawn a Chinese dragon. He claimed that ever since he could remember dragons had always been unlucky to himself and his family —and he did so want to enter Cooper Union. I exchanged cards with him, not because I favored Chinese art or superstition, but solely to quiet him. I hope he was fortunate in the examinations.

All eyes were focused upon one spot in that auditorium—the clock. When word at last was given to begin work, six hundred hands grasped pencils and began to write furiously. The clock ticked away the precious minutes which meant so much to those young men, inspired with a lust for knowledge. The allotted time seemed altogether too short for the examinations. Six hundred silent men filed out of that auditorium that night, secretly muttering imprecations against the hands of time which stop for nothing. Most of those men went home with their aspirations of entering Cooper Union greatly diminished. The next evening practically the same performance was enacted as the second group of approximately six hundred men took their examinations. Ages seemed to pass before nearly one-half of the original number of applicants were notified that they were eligible for the entrance examinations. And so once again the process of elimination was repeated. In the end the postman delivered two hundred and eight cards reading:

"You are hereby informed that you are admitted to the First Year Class of the Night School of Engineering." That was enough to know—it was the consummation of two hundred and eight earnest young men's desires for intellectual advancement.

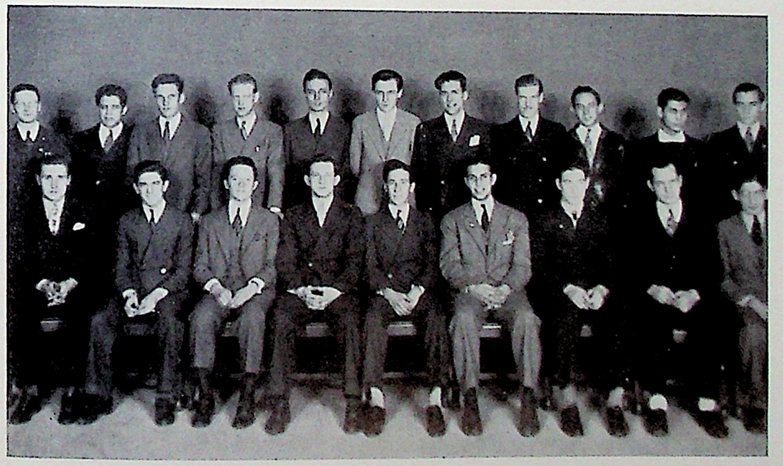
On a night in September 1935, these same two hundred and eight young men, seated in the auditorium of Cooper Union, listened to Dean George F. Bateman as he officially greeted them as new students of the school. He counselled them that their's would be no easy task, that they must be prepared to make every sacrifice for the sake of the education for which they had entered Cooper Union.

With the measured, decisive tread of men, who will one day surely make their mark, these same youths entered into the hallowed halls of this institution of learning to study and later to further the theories of science and engineering which it so freely teaches. Since September, the freshmen have played their individual and communal roles as students and men in a conspicuous but commendable manner.

This, then, is the story of the freshmen, both singly and as a group; it is a story of their achievements, their shortcomings, their hopes and their future leanings.

One of the first official but pre-decided acts of the class was its election of officers. Each of the seven sections elected a delegate to represent it in the freshman council; from these seven the final selection of class officers was made as follows: Alfred I. Zelman, president; Fred C. Hamel, Edgar Budden, and M. S. Plum, 1st, 2nd, and 3rd vice-presidents, respectively; Anthony Ancona, treasurer; Harry A. Weil, assistant treasurer; Sidney Deutsch, secretary. Robert Wood, the class historian was chosen by the freshman council after careful deliberation.

The work of the aforementioned student officers has been no easy task. They have given freely of their time and energy in the best interests of their fellow classmen.



Top Row—Crowley, Chernoff, Brickfield, Blenk, Bildziukiewicz, Braun, Delassalle, Attwood, Cohen, Corin, Bulger. Bottom Row—Alessi, Bryer, Brand, Alpert, Ancona, Bindman, Ashkanazi, Cohen, Birnbaum.

Meeting after classes on every Monday of the school year, they often found it necessary to remain at school until the midnight hour, proposing and debating on questions pertinent to their class. No finer example of service and sincere regard for the class can be shown than that of Harry A. Weil, who must commute after these meetings to his home in the suburbs, arriving there usually in the early morning hours.

Early in the term, the freshmen engineers were invited to attend the annual Soph-Frosh stag affair which was held at Nicholaus' Restaurant. Their convivial spirits aroused, the freshmen responded to the invitation in good style. At the affair, with much hearty hand shaking and back slapping, they were entertained by the sophomores and faculty alike and were introduced to the popular legends and humor of Cooper Union. Needless to say (at least it has been reported so by yearling Zaharakas and others), the freshmen were quite able to hold their own against the imbibing powers of the upper termers.

Burning the midnight oil, investigating the intricacies of math and science, the freshman class buried itself in studies, aided no little bit by the good natured advice of the instructors. For the capable manner in which these same savants undertook to reassure and instruct those of us to whom the scholastic barriers seemed at times insurmountable, we hereby extend our most sincere thanks. To the library staff we are also grateful for their friendly cooperation and guidance.

Descriptive geometry, so ably propounded by the Messrs. Church and Lofgren, was a source of worry to many and a delight to some (though of the latter there were very few). The fog overhanging the descriptive geometry classrooms was almost impenetrable, but luckily the above mentioned instructors (being well versed in the art of penetrating fog) were able to clear up most of the difficulties before the eventful examination day rolled around.

Chemistry, being a new subject to some unfortunate students, presented manifold difficulties. Untold advantages, however, were derived from this course taught so capably by Prof. Enders and the Messr. Sherman, Mueller, Szymanowitz, and Tarr as evinced by the development of talent for scientific investigation; although the development of these talents was retarded somewhat when a few students with a nose for investigation opened a valve on a cylinder containing hydrogen sulphide gas.

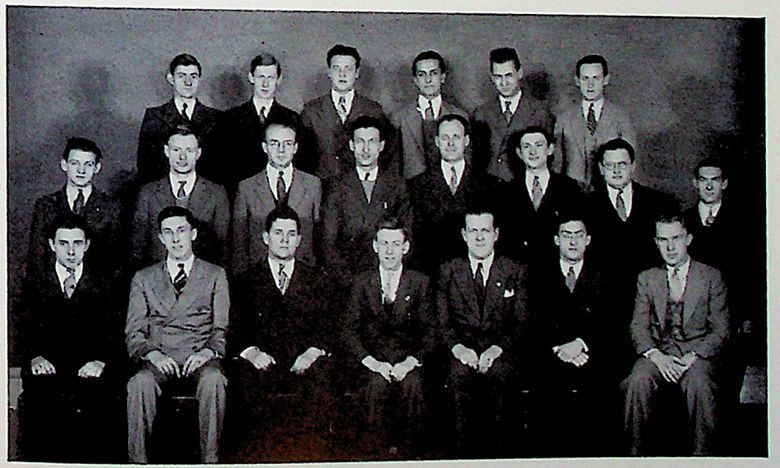
Mathematics was a constant source of consternation to many during their freshman year. Many thanks are due to Messrs. Tanzola, Taplin, Sheridan, MacLean, and Dr. McMackin for their human attitude towards us. We hope that the next freshman class causes them less trouble. We all shall certainly look forward to having these same teachers for an advanced course in mathematics.

The course in Engineering Drawing was an interesting one and for that we have to thank Messrs. Salmonsen, Langguth, Currey, Lofgren, and Puller. We hope that our ellipses, parabolas, and hyperbolas did not look too much like the charts of a seismograph. If our plates in orthographic projections misrepresented the objects please be assured that by the time we graduate (if we graduate) we shall (we hope) have learned the art of true projection.

The English Department and especially the Messrs. Riedel and Gorham have our fullest thanks for having developed in us (but oh! what a task) the method of punctuating properly and of speaking so that we can be understood by other people besides ourselves. Many an evening was made interesting by these instructors. We hope our vulgarisms and our barbarisms (in speech and otherwise) have improved.

To those men of the freshman class who withstood what seemed a barrage of study, congratulations are due. To the unfortunate few whose outside work did not permit of sufficient time for study and who subsequently took leave of the school the class offers its regrets and good wishes.

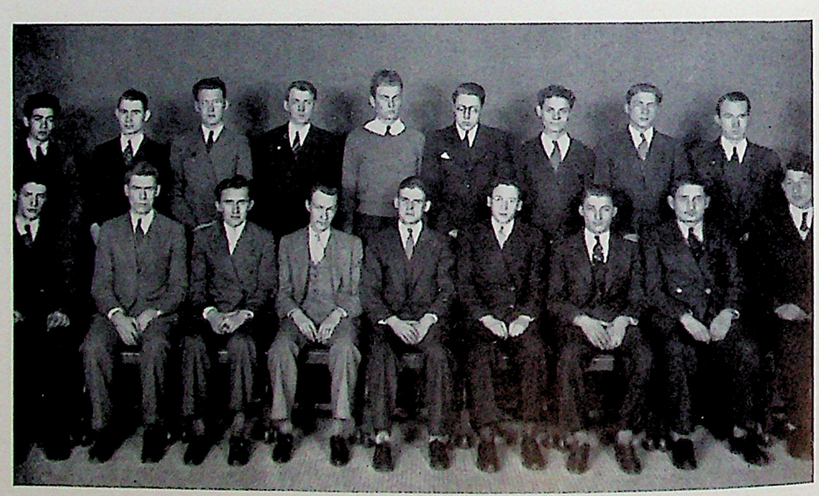
Top Row—Manrodt, Goltsos, Dorfman, Di Petto, Egbert, del Barco, Downing. Middle Row—Dixon, Lipkowitz, Fensterer, Foster, Dishuck, Early, Downs, Miller. Bottom Row—Gold, Gallery, Mendel, Deutsch, Fine, Fiedler.



Top Row—Ellner, Hall, Handschu, Imbesi, Haniq, Kilminster. Middle Row—Hansen, Hartman, Kaercher, Gordon, Kahn, Axelrod, Kalashnikoff, Katz. Bottom Row—Hilbert, Iversen, Johnson Hamel, Higgins, Kassman, Johnsen.

It was proposed during the second meeting of the freshman council, to hold some function for the members of the immediate and upper classes. A dance and entertainment committee was organized consisting of: Edgar Budden, chairman, Anthony Ancona, Fred Hamel, and Alfred Zelman. These men offered a questionnaire to the class, which voted greatly in favor of holding an informal dance. Several hotels were visited by the committee men who chose the Beekman Towers, formerly the Pan-Hellenic Hotel, as a likely place for the affair. After having heard many orchestras the committee in charge of the music, namely Anthony Ancona, chairman, Edgar Budden, Fred Hamel, and Alfred Zelman, selected Sidney Feller and his orchestra to supply the music. The dance committee next invited Dean Bateman, the entire freshman faculty and members of the upper classes to the gala affair. On January twenty-fifth, the freshmen, sophomores and their friends met on a terpsichorean field of honor at the Beekman.

Soft lights and sweet music revealed quite unexpectedly that our hard-working, studying brethren were light-footed as well. After a few hours of strenuous effort on the part of The Cooper Union's "Fred Astaires," the tired and somewhat downtrodden (at least by the looks of their slippers) females were given a well earned respite in the form of professional entertainment tendered by Mr. Paul Fernandez and charming (to say the least) partner. Incidentally these same individuals are instructors at the well known Arthur Murray dance studios. After the exhibition of the Tango, Rhumba and Waltz which was well received, the Class of 41 counter attacked with a square dance—and then the fun began—Marty Plum (alias Mr. Objector to the Frosh council) ran away with our president's girl friend while Al was busy stuttering his announcement. Fred Hamel (who had been making love to a bottle of wine (?-?) instead of to his spouse) lured Phil Hagerty's charming wife, Estelle, to the arena and climaxed the dance with a trip to the slippery floor! Were their faces



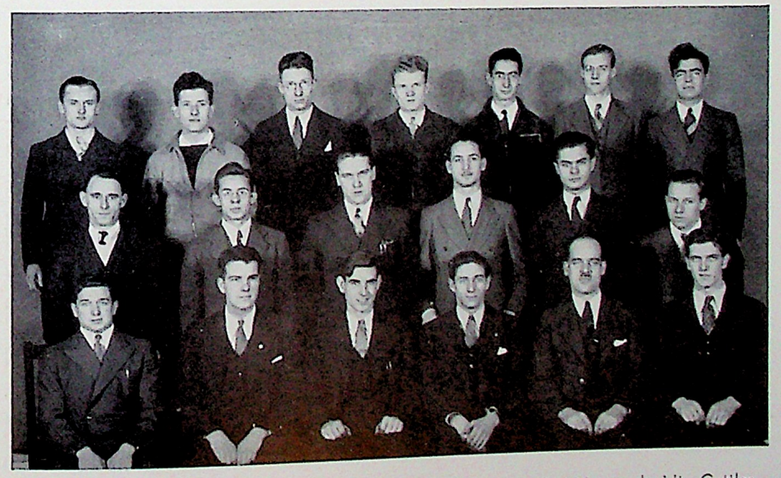
Top Row—Lincer, Lusckus, Luchun, Mai, Kremer, Koretz, Kossak, Koch, McCarthy. Bottom Row—Krohn, Lange, Latour, Kovaleski, Budden, Konigsberg, Margolin, Banker, Lebowitz.

red!! Bob Stewart, whose passion for argument is well known to a goodly number of the class, showed himself quite adept as a dancer of the "Shag," a dance which he alone seems to know. A number of the more energetic individuals feeling sorely in need of vitamins A to D inclusive jammed themselves into a taxi-cab (with Fred Hamel and Al Zelman at the bottom of the pile) and proceeded to Child's Spanish Gardens where they monopolized a section of the restaurant and partook of such delicacies as they desired. Was that a cream pitcher which Marion Hamel was concealing under her evening wrap as the jovial party departed? (Apologies to Mr. Winchell.) That the affair was a success, goes without saying. Anthony Ancona, who, in his position as class treasurer, had control of the finances of the dance, can well attest to this. Incidentally, "Tony's" capable handling of the class accounts and subsequent bookkeeping merits him the grateful thanks of the freshman student body.

The class is also indebted to the Publicity Committee which was composed of the Messrs. Hamel, Deutsch, Plum, and Weil. This committee helped keep the entire school posted on the affairs of the freshmen. Frequent reportorial contributions were made to the Pioneer by them. It is noteworthy, by the way, that the Pioneer received the complete support of the new men—their enthusiasm in the school's affairs was often commented upon. As is customary with first year men, fraternity bids were passed around to some of the students. A few of the young men eventually became pledgees in the various organizations after being introduced to the delights of fraternity fellowship.

The brief respite from the long, hard grind that came with the Christmas holidays was appreciated by one and all, although it was rumored about that several of the yearlings spent a considerable amount of the time in study.

Congratulations are due to Julius Cohen for his ambitious spirit. Julius finished



Top Row—R. Richards, Palestine, Meyer, Mittenhuber, Ohrenstein, Messerschmidt, Cuttler. Middle Row—Phillips, Morrison, Morrow, Nagoshiner, McLaughlin, McGee. Bottom Row—Pesce, Pagdin, Kober, Plum, G. Richards, Sorenson.

the night course of The Cooper Union School of Architecture and is now taking a six year course in engineering. Good luck Julius!

Are you having trouble with your "Lionel Electric Trains"? See Stephen Alessi —he works for the Lionel Corporation.

Henry Blenk will have to contend with a great deal of "cutting in" at the annual dance. We have advance information on Henry's girl friend. Rumors have it that she is a very, very, pretty damsel. How about it Henry?

Jack Alpert is reputed to have a good line of jokes. Ask him to tell you the one about the two Irishmen.

Pete Hartman always seems to be peering out of that seventh floor window. How is the weather (?) these days, Pete?

A pair of boxing gloves ought to be given to Wil Higgins and Charlie Hartman. They are always scrapping about something, it seems. Cherchez la femme! eh! boys?

At the close of this, our first year at The Cooper Union it would be well for us to pause for a moment to recall some of the admonitions and words of Dean Bateman. That we must sacrifice most of our pleasures for our studies, we already know from past experience. That the course at Cooper is a difficult one, is another well known fact. Looking forward then to five difficult years, we would determine at the outset that no matter how difficult the ensuing years may be, we are going to finish the job that we started. Let us carefully plan our studies from now on and adhere to our plan. We must face the future with optimism and a will to do. Optimism coupled with incentive and ambition has always been and always will be the torch for advancement. And so, as we leave our freshman year behind us and look forward to a four-month period of rest and recreation let us keep the following words of a famous author in our minds:

Top Row—Sachs, Sigman, Schwartz, E. Smith, Springer, Roth, Rosenblum. Middle Row—Maurin, Seckler, Skiba, Selman, Rullo, Rueb, Rozene, A. Smith, Bruckenthal. Bottom Row—Simachkewich, Simon, Spielman, Weil, Spector, Schneier, Vinci.

IT'S ALL IN THE STATE OF MIND!

If you think you are beaten, you are;
If you think you dare not, you don't;
If you think you'd like to win, but you can't,
It's almost a "cinch" you won't.
    If you think you'll lose, you've lost,
    For out in the world you'll find
    Success begins with a fellow's will—
    It's all in the state of mind.
Full many a race is lost
Ere even a race is run,
And many a coward fails
Ere even his work's begun.
    Think big, and your deeds will grow,
    Think small and you fall behind;
    Think that you can, and you will;
    It's all in the state of mind.
If you think you're outclassed, you are;
You've got to think high to rise;
You've got to be sure of yourself before
You can ever win a prize.
    Life's battle doesn't always go
    To the stronger or faster man;
    But sooner or later, the man who wins
    Is the fellow who thinks he can."

Top Row—Struyk, Maslow, Wernander, Wade, Toback. Middle Row—Yamdolsky, Wiemert, Wermer, Woessner, Zakrofsky, Chadwick, Weissman, Steinberg. Bottom Row—White, Stern, M. Weiss, L. Weiss, Zelman, Wood, Zuck, Zuckerman.

Cooper Tech

I

When first I came to Cooper
I thought I knew it all,
But after I was there a while
My pride had quite a fall.
I found that I must study
For many a weary year
Before I am a graduate
And a helluvan engineer.

CHORUS

A helluva, helluva, helluva, helluva,
Helluvan engineer.
A helluva, helluva, helluva, helluva,
Helluvan engineer.
I found that I must study
For many a weary year
Before I am a graduate
And a helluvan engineer.

II

"Oh send my son to Harvard!"
The dying mother said.
"But if he goes to Harvard
I'd rather see him dead.
I'll send my son to Cooper,
It's better than Cornell,
But if he goes to N.Y.U.
I'll see him first in hell."

ELECTRICAL ENGINEERING

WHEN Benjamin Franklin flew his famous kite in Philadelphia in 1760, he hardly comprehended the significance and importance his discovery would have on the life of future generations. The utilization of electric power has helped to join continents, to improve health, to provide leisure entertainment. The electrical engineer has taken advantage of nature's gift of electricity in more ways than were ever imagined by fantastic writers describing phenomena of the future.

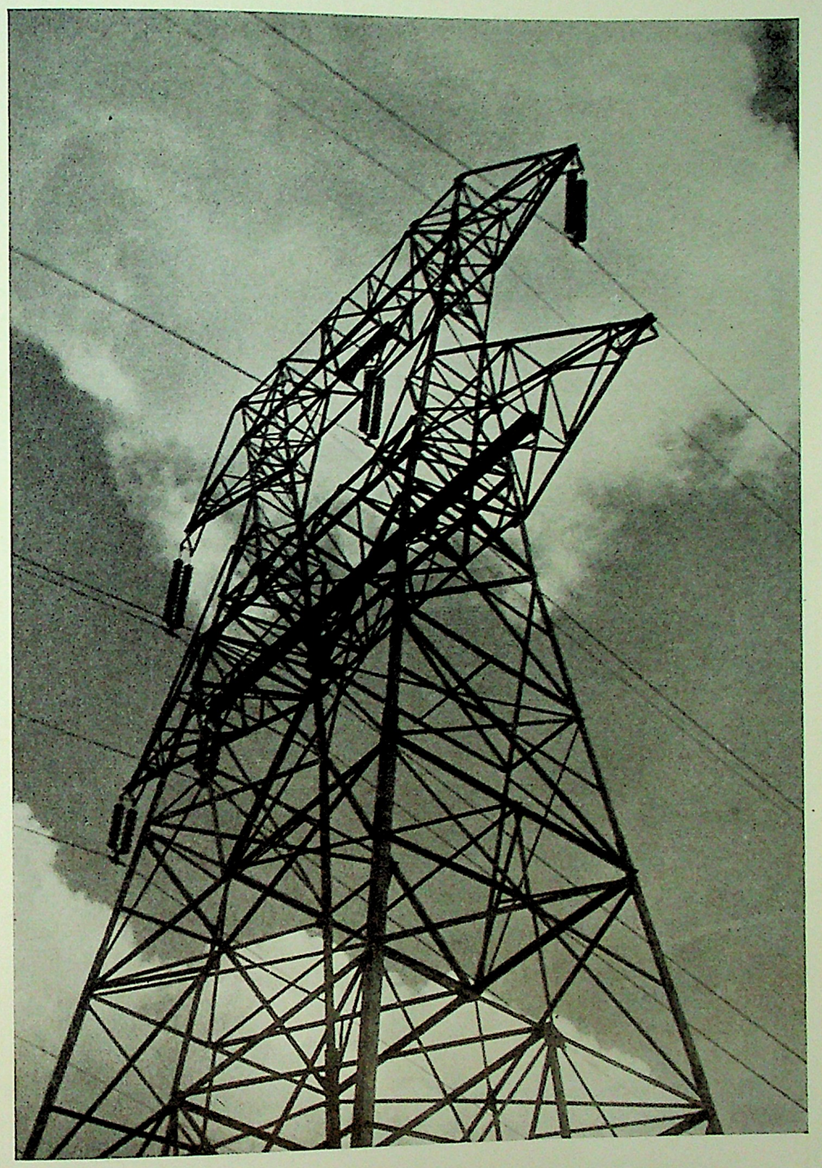
The telephone, telegraph, radio, electric lighting and heating, talking pictures, electrical appliances, electric treatment of disease, all these have become part of our everyday life. We show hardly more wonder at such marvels as power from Niagara Falls, automatic flying, the photo-electric eye.

We accept the telephone as such an urgent essential of our business and social life that we can hardly conceive of a time when it was not. Despite this, the attempt to carry voices through the air was considered false magic. This "magic" is now employed every minute, every hour, every day from New York to San Francisco, from London to Paris, for business negotiations, international diplomatic conferences, social discussions.

The telephone and the telegraph have done even more than the aeroplane toward conquering time and space. The interchange of news and thought between men in the farthest corners of the earth have been made possible by the work of the electrical engineer in the improvement of the inventions of Bell and Marconi, and more recently in that marvelous instrument of education and entertainment—the radio.

The Radio City Headquarters of the National Broadcasting Company is the world's largest broadcasting plant. It was designed and constructed under the direct supervision of electrical engineers and embodies all of the most recent improvements in the technical equipment of the radio art. In addition to the studios and control rooms, NBC's Radio City headquarters contain a complete experimental laboratory, where tests are constantly being conducted in an effort to improve existing equipment and develop new and better technical devices.

Police radio, aviation radio, marine radio, international broadcasting, have all presented separate difficulties which the electrical engineer has adequately solved. The electrical engineer no less than the civil engineer is daily making nature work for man. The great scenic splendor of Niagara Falls is of minor importance as compared to its significance as an industrial agent. The power from the Falls is transmitted by high tension lines, 132,000 volts extending as far as New Rochelle. Modern electric equipment has made practicable the development of water power



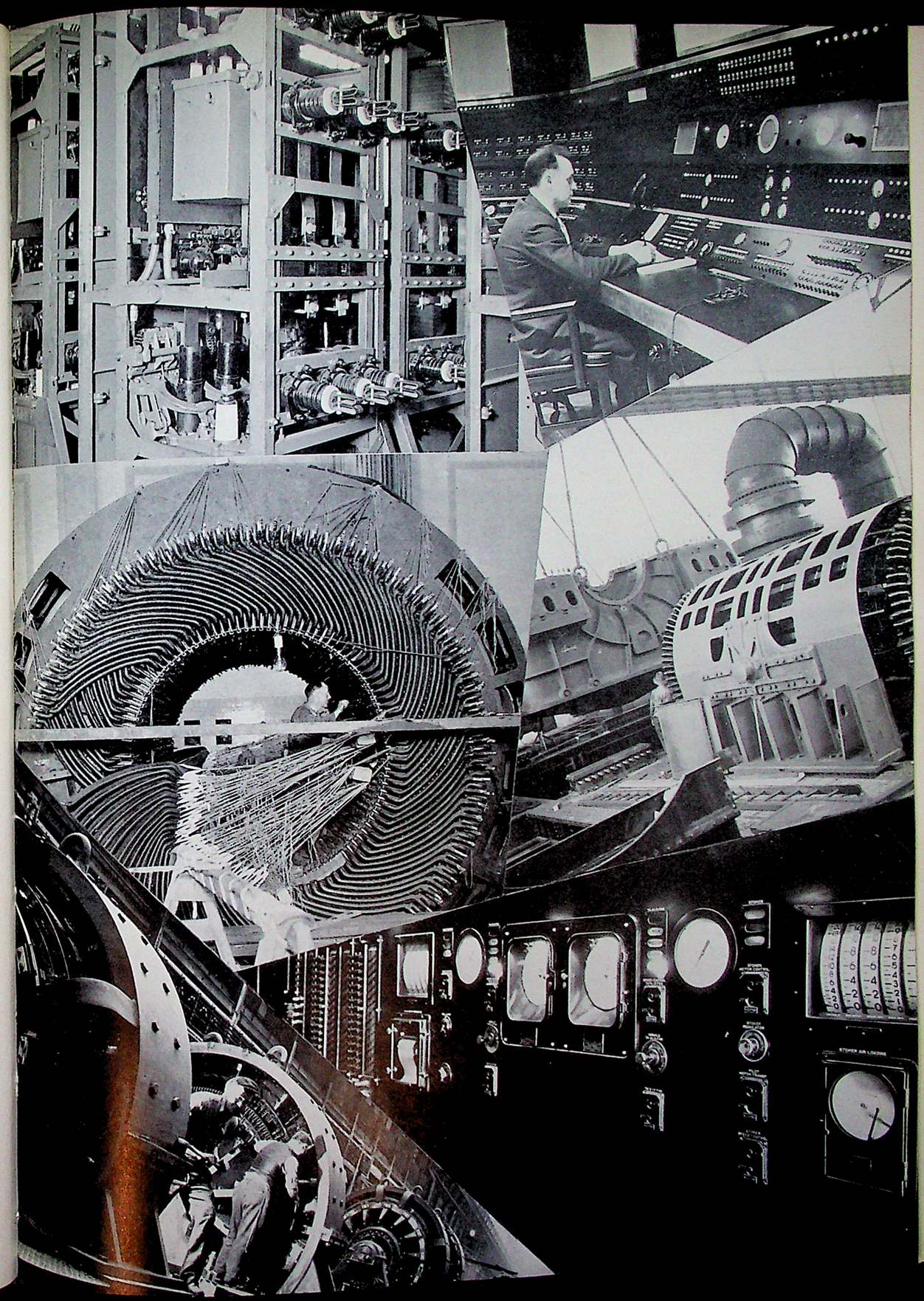
which in the past could not be used on account of high production costs.

In the use of steam power for electricity remarkable achievements have also been realized. Nowhere is this great achievement better exemplified than in the growth of the Hudson Avenue station of the Brooklyn Edison Company. Started in 1922 with the then highly courageous intention of an ultimate growth to 400,000 kilowatts in eight units of 50,000 each, today finds it the world's largest steam power plant with a capacity of 770,000 kilowatts.

Hudson Avenue station is the basic source of power for the Borough of Brooklyn and in addition, through interconnection with the other stations of the metropolitan area, can furnish power to the Borough of Queens and to lower Manhattan. It is the chief source of power and light for the two and one-half million people in Brooklyn. Thus, the conditions under which the station is operated are very exacting as to continuity, frequency, voltage and load control. It is indicative of the skill of the engineer that the station today containing 770,000 kilowatt capacity, does not extend beyond the walls originally set to include 400,000 kilowatt capacity. The operation of this tremendous plant is an excellent example of city electrification.

Rural electrification is another problem for the engineer. The electrical engineer shares honors with the civil engineer on the TVA project. Here we see a unique development of rural electrification. As an example of what is being done, the history of the Alcorn County Electric Power Association is briefly related. Alcorn County in northeastern Mississippi, set up a county-wide cooperative power distribution system in June 1934. The significant contribution of Alcorn County's cooperative is its policy of supplying power to farmers at rates identical with those charged the urban residents of the county. With rates down approximately 50 percent, residential consumption in Alcorn County climbed from an average of 49.4 kilowatt-hours per month to 83.3 kilowatt-hours in the first six months. The consumption is still climbing.

There seems to be no end to the ramifications of the work of the electrical engineer. Inauguration by the Pennsylvania Railroad of through electrified passenger train service between New York and Washington will bring very nearly to completion the most extensive electrification project in transportation history. The program embraces electric operation of both freight and passenger trains over 225 miles of main line, on which traffic in both branches of the service is extremely heavy and highly important. Operation of the freight trains all the way through by electric power is planned to follow closely the inauguration of the electrified passenger service.



Before entering upon an undertaking of such magnitude and far-reaching consequence, extensive and thorough studies were made, extending over a number of years. Consideration was given not only to the generally known characteristics of electric operation and their relation to conditions along the route itself, but also to the transportation and industrial situation in the entire eastern part of the United States.

Electrification of the Pennsylvania Railroad between New York and Washington enables the railroad to overcome conditions peculiar to this section of the country, where density of traffic through populous territory makes it more economical to increase the capacity of the railroad for the future by electrifying than by building additional roadway facilities to provide for the growth of business over many years to come. In addition, electrification makes possible substantially lower operating costs for each train moved one mile.

Electrical engineering has influenced the fields of communication, of transportation and travel; it has entered business and the home; it is important in work and play; it concerns the technician and the housewife; it is essential in health and sickness. As we look back on what has been accomplished by the electrical engineer, it seems incredible that there are many more possibilities which he sees as commonplaces in the future. It is difficult for the layman to conceive of more extensive applications of electrical power. And yet, in the fields of agriculture and biology, for example, the electrical engineer has barely touched the surface.

As the electrical engineer looks to the future, he sees, perhaps within the lifetime of this generation the perfection of television. For example, while they cannot predict the date of the advent of practical television broadcasting, RCA has made extensive plans for its arrival. The studio section of RCA is honeycombed with ducts through which the wiring for "sight" programs can be run, and the lighting equipment is capable of carrying the extra load which television will require.

RCA believes that the United States is further advanced scientifically in the development of television than any other country in the world. RCA is now engaged in a three-point plan, to take television out of the laboratory for its first comprehensive field tests. The steps of this plan are to establish the first modern television transmitting station in the United States to manufacture a limited number of receivers for placement at strategic points of observation.

The electrical engineer can truly be called a modern genie. He has made sound transmission not subject to the limitations of space; with the perfection of television, sight transmission will make distance and isolation obsolete terms.

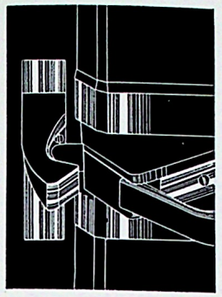
FEATURES

LOOKING through the feature section, one is amazed at the widely varying activities of the graduates of The Cooper Union. From detective to lawyer, salesman to engineer, cartoonist to sculptor, they seem to have entered into all fields of endeavor.

This variation of vocation gives strong proof of the soundness and thoroughness of the courses of study given in the Engineering and Art Schools of The Cooper Union. The training given the students seems to fit them for many fields other than the ones for which they originally prepare. Our graduates have brought honor to themselves and their Alma Mater!

ENGINEERING ALUMNI

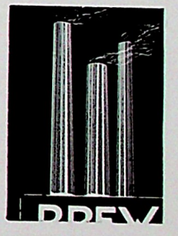
TO CARRY out our theme, we have gathered information from all over the country concerning graduates of The Cooper Union Engineering Schools. We present this interesting data so that you may take pride in their achievements.

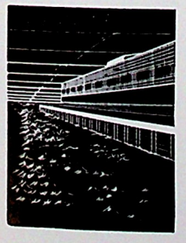


Arthur L. Boltizar took his degree as Mechanical Engineer with the General Science Class of 1926. Following this, he took courses at night in heating, ventilating, electricity, and gas engineering at Brooklyn Polytechnic Institute. Mr. Boltizar is a member of the American Society of Mechanical Engineers and of the New York State Society of Professional Engineers, Kings County Chapter, receiving his license as professional engineer from New York State in 1934. He is at present employed as Superintendent in the Engineering Department of Kings County Lighting Company, Brooklyn.

Arthur Henry Goetz, a member of the class of 1909, received his degree of Bachelor of Science from the General Science course of The Cooper Union. He is now a member of the firm of Stout and Company, New York City, and on the New York Stock Exchange.

Waldemar Mortensen, today an instructor in the National Brewers Academy of New York City, received his degree of Civil Engineer with the General Science Class of 1892. Since his graduation he has specialized in the construction of breweries, ice plants, abattoirs, and refrigeration plants. Almost every state in the East has been the scene of his activities. Mr. Mortensen has been considered a Brewery Architect and Engineer since 1893 and took his own office in 1902 as a consulting engineer.

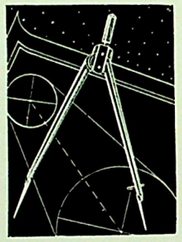




William Henry Cherry received a B.S. degree in 1891 and a C.E. degree in 1903 as a result of post-graduate courses. After having served as Divisional Engineer for the Department of Docks for 44 years, Mr. Cherry is now in retirement. He has established the relation of Mosman's triangulation of Greater New York to the Dock Department system of rectangular coordinates, so that by means of formulae all coordinated monuments in the five boroughs could be converted into the Dock Department system. This meant that the monuments established by the several Topographic Departments, the monuments of the Jamaica Bay Commission, and the New York State Conservation Commission could be used by the Department of Docks in waterfront work. Mr. Cherry has also been active in the design and construction of derricks, scows, pile drivers, and other structures relative to docks.

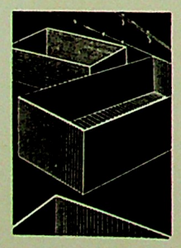
After graduating from the General Science course in 1917, **Edward D. Fox** took courses in the University of Wisconsin, including Structural Analysis and Design, Statically Indeterminate Structures, Analysis and Design of Rigid Frames, and Analysis and Design of Curved Members. He went to the John Huntington Polytechnic Institute from 1932 to 1934 and was engaged as Structural Designer with Erie Railroad Company in Cleveland, Ohio. He designed numerous piers, warehouses, railroad and highway bridges, and viaducts. In recent years his work has been connected mainly with large grade crossing elimination projects.

David V. B Conley received his Civil Engineering degree from The Cooper Union in 1896. His activities in engineering have been many, but most important was his position with Lange and Noska. While employed here, he assisted in the designing of many well-known structures. Among these are: the New Yorker Hotel, the Williamsburg Savings Bank, the Continental Bank Building, and the Riverside Church. In the past year, he also designed several post offices for the U. S. Treasury Department, Procurement Division.

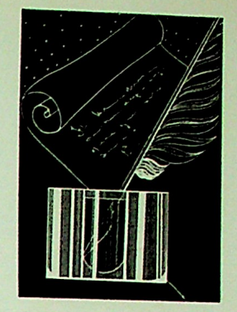


Francis G. Cosmen graduated from the Civil Engineering course in 1927 and received his Professional Engineering License from the State of New York on June 10, 1930. At present he is an Assistant Engineer wtih the Bureau of Investigation and Statistics, Department of Finance, City of New York. In this capacity he investigates construction in accordance with plans and specifications, of hospitals, schools, fire houses, and other public buildings. He received his Post Graduate Degree of Civil Engineer from Cooper Union in June, 1933.

ONE of the members of the General Science Class of 1907 was **George D. Moore.** In the course of his interesting career, he has been President of the Casualty Actuarial Society during the years 1928 to 1930 and is now President of the Association of Casualty and Surety Accountants and Statisticians. Mr. Moore also holds the position of Comptroller of the Standard Surety and Casualty Company of New York.

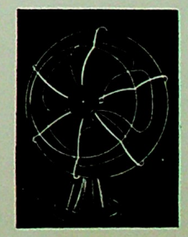


In 1905 **George P. Eberlin** graduated from the General Science course of The Cooper Union. During the next two years he took post-graduate work at Brooklyn Polytechnic Institute. Shortly after graduation, the Western Electric Company recognized his value and honored him with the position of Supervisor of Central Office Installation in New York State, New Jersey, and Connecticut. In June 1927 he was transferred to the Long Island Area. In this territory he has the sole supervision of all Manual and Dial Central Office Installation done by the Western Electric Company.

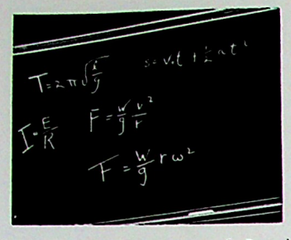


A graduate of 1903 from the General Science course, **Mr. Charles Kenison** has nothing but the highest esteem for the training he received in The Cooper Union. Deciding that his talent tended more toward the legal rather than the technical direction, he entered the New York Law School and graduated in 1912 with the LL.B. degree, and in a post-graduate course he received the LL.D. degree. He also attended New York University for Constitutional Law after which he entered the American Bar Association. During the war, Mr. Kenison helped as lawyer on draft law.

THE late **Charles H. J. Dilg** was a graduate of the General Science course in 1889 and received his diploma of Mechanical Engineer in 1895. He launched out into business for himself in the manufacture of special machinery for the pantries and kitchens of catering establishments, including clubs, hotels, railroads, restaurants, and steamships. In the course of twelve years he had built up a flourishing business, but the Great War played havoc with his further progress by calling away his good mechanics and by making it difficult to get materials needed for the construction of machines. Under such difficulties, which continued for the duration of the war and the following years of reconstruction, the business failed to make any advancing strides, as a result of which he turned his attention to the purchase, improvement, remodeling, and sale of real estate in which he became very successful. Among Mr. Dilg's many interests was a strong desire for inventing, and he has to his credit several patents on ball-bearing retainers, the oscillating motion for electric fans, knife cleaning and polishing machines, meat cutting machines, and the most recent patents on two inventions have been granted as late as 1934. Being a member of the Jefferson Literary Society, he developed his literary trend by editing and publishing for a period of fifteen years a house organ containing original epigrams, essays, humor, and poetry, which enjoyed a nation-wide circulation under the name of "The Dilg Adviser."



FOLLOWING graduation as Mechanical Engineer in 1924 from The Cooper Union **Mr. Edwin H. Dafter** took a business course at the Alexander Hamilton Institute in 1928. Completing his education, he has built up a reputation as an engineer in air conditioning. He designed and had charge of the installation of the largest installation of air conditioning prior to 1935—the J. L. Hudson Department Store in Detroit, Michigan—the contract totalling $750,000.00. He has designed and installed many large theatre air conditioning systems throughout the country. Mr. Dafter now has direct charge and responsibility of all engineering for the Carrier Engineering Corporation of Philadelphia in their southeastern district. He has been with this corporation since 1917 and now holds the position of District Chief Engineer. Mr. Dafter declares, "I give to The Cooper Union a large share of the credit for whatever success I may have had."

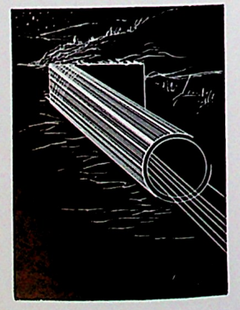


Upon graduating from Cooper Union Engineering School, **Mr. Erich Hausmann** continued his studies at the Polytechnic Institute of Brooklyn during the years 1907 and 1908, receiving his degree as Electrical Engineer. This was followed by a graduate study in Physics at New York University, 1908-1911, receiving degrees of Master of Science in 1910 and Doctor of Science in 1911. He has been connected with the Polytechnic Institute of Brooklyn since 1908, and at present holds the position of Dean of Graduate Study and Professor of Physics and Electrical Communication. He is also chairman of the New York State Board of Examiners of Professional Engineers and Land Surveyors. Mr. Hausmann, despite his many duties, has taken time out to author the following textbooks: "Telegraph Engineering" and "Dynamo Electric Machinery." He has also collaborated on "Direct-current Machines," "Alternating-current Machines," "Electric Traction and Transmission Engineering," "Physics Laboratory Experiments" and "Physics." At the same time he is editor of Swoope's "Lessons in Practical Electricity" and "Radio-phone Receiving."

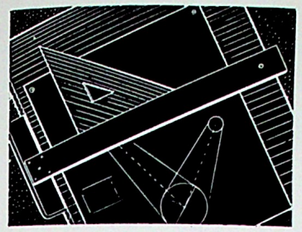
Theodore Lewis Buser donned his cap and gown in the year 1926, having completed the General Science course at The Cooper Union. He is now applying his talents in the Central Drafting Office of the Bureau of Construction and Repair in the Brooklyn Navy Yard.

Walter B. Langbein, a graduate of the 1931 Class in General Science, received his B.S. degree and continued his studies with post-graduate work in the Polytechnic Institute of Brooklyn from 1932 to 1935. Being employed as Junior Hydraulic Engineer under U. S. Geological Survey, he has been engaged in research in Hydraulics and Hydrology.

AMONG the members of the graduating class of 1924, General Science course, **Sidney R. Brown** received his B.S. degree in Civil Engineering. At the present time he holds the position of Structural Designer with the Board of Transportation, City of New York.



One of the many successful graduates of the Electrical Engineering course, class of 1926, **Clifford A. Rodd** has been employed for the last thirteen years by the Brooklyn Union Gas Company, and in this time has elevated himself to the position of Superintendent's Assistant at the Citizens Plant. In this capacity he has completely re-designed this plant and partially designed the present Greenpoint Plant. At present he is in charge of production at the Citizens Plant. Since his graduation from Cooper Union he has studied Gas Engineering and Chemistry at Brooklyn Polytechnic Institute and Fuel Technology and Radio Communication at Columbia. He is also President of the Polytechnic Alumni Gas Engineering Society.



Following his graduation in 1920 from the course in Civil Engineering, **Charles Jellinek** took post-graduate work with the Brooklyn Edison Company, studying Power Plant Operation, Accounting and Public Utility Economics, and other allied subjects. He was inspector on construction of sewage disposal system for the Borough of Downington, Pennsylvania; draftsman on I.R.T. power house and sub-station layout for New York Edison Company; chief of party on construction of roads and water lines around Covington, Kentucky; chief of party on construction of roads and water lines in Akron Ohio; and designer of details for Loew's State Theatre, New York City. He entered the employ of the Brooklyn Edison Company where he progressed from draftsman to Divisional Engineer of the Design Bureau of the Mechanical Engineering Department. Mr. Jellinek collaborated in the design and construction of the Hudson Avenue Generating Station, Brooklyn; in the design of various sub-stations and other buildings; preparation of specifications, cost estimates, budgets, cost analyses, and special reports.

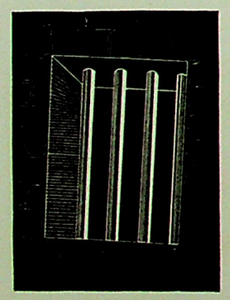
In 1902 **Samuel Levisohn** took his degree as Bachelor of Science, graduating from the General Science course of The Cooper Union. Deciding that he, perhaps, would make a greater success as a lawyer than as an engineer, he entered New York Law School in 1903 and three years later received his LL.B. degree. The following year, 1907, he was admitted to the bar. Mr. Levisohn is now engaged in law practice.

William H. Bertram received his B.S. with the General Science Class of 1909. In 1916, he appeared at the Commencement Exercises to receive his degree of Civil Engineer. Working as an engineer in the Department of Sewers of New York City, he has held the position of Engineer-in-Charge of Sewer Design for the Borough of Queens since 1928.

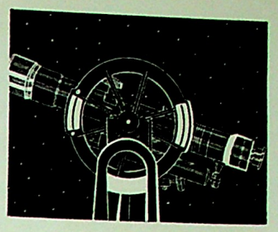
Louis J. Borstelmann, a graduate of the General Science course in 1916 and the Civil Engineering course in 1926 has had a varied career since his graduation. He has been employed as an Assistant Engineer with the New York Subways, a Resident Engineer at Camp Zachary Taylor, Chief Plant Estimator with the Emergency Fleet Corp., Plant Engineer with the Liberty Shipbuilding Co., and a Field Engineer with the Portland Cement Association. Mr. Borstelmann is a Registered Professional Engineer, a member of the A.S.C.E., an Engineer Member of the Society of American Military Engineers, and a member of the Portland Cement Association.

Charles Goodman received his degree of Civil Engineer from The Cooper Union in 1905. From 1904 to 1916 he was employed by the City of New York, advancing himself through Rodman, Draftsman, Leveler, Assistant Engineer, and, just before resigning, to Assistant Division Engineer. Upon resigning, he became Works Manager for the Heyman and Goodman Company in which he was also a partner. In this position, he controlled the construction of three large subways in New York City and Philadelphia. He was also the consulting engineer for three subsidiary companies, which constructed five sections of subway in New York City. His importance as a construction engineer can be seen from the fact that the subway constructions on which he worked were valued past $50,000,000. In 1929 and 1930 Charles Goodman, as a constructor and owner, erected buildings in New York City worth approximately $10,000,000.

THE varied and active professional career of **Chester Mueller** began with his graduation from the General Science course at Cooper Union in 1924. He received his degree of Civil Engineer from Cooper Union. Meanwhile Mr. Mueller had branched out into law with the purpose of practicing both professions and received the degree of LL.B. in 1927 from the New Jersey Law School. In 1932-1933 he completed a graduate course in Patent Law at New York University. He is a member of the New Jersey Bar, at the same time holding his license as a professional engineer in that state. At various times he has contributed to the proceedings of the American Society of Civil Engineers and to current technical magazines. Professionally busy though he may be, Mr. Mueller does not forget his civic responsibilities, holding a commission as Captain in the U. S. Army Reserve in the Ordinance Department. He is also a member of the Essex County Bar Association, a director of the Newark Municipal Engineers Club and of the Essex County Chapter of the New Jersey Association of Professional Engineers and Land Surveyors, and a member of the Army Ordinance Association.

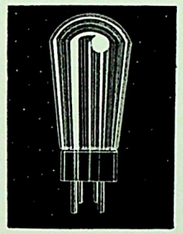


In 1917, the General Science course of The Cooper Union graduated a man who later became a well-known construction engineer. This man's name is **Dominic J. Ermilio.** He took a post-graduate course at Brooklyn Polytechnic Institute during 1923 and 1924. Mr. Ermilio has been specializing in building construction for the past sixteen years as a construction engineer. While employed as engineer on the construction of concrete piers, he invented the methods and apparatus for placing concrete sheet piles, for which he received a patent on February 12, 1924. At present Mr. Ermilio is gaining credit for himself and The Cooper Union as construction engineer for Pellacchia Construction Company which is building the Bordentown Prison in New Jersey.



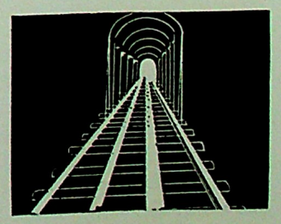
In 1910 The Cooper Union bestowed on **William Goldsmith** a degree in Civil Engineering. Since then he has become a licensed professional engineer. As District Engineer of the Pangasinan Province of the Philippine Islands, he received first prize for constructing the best system of first class roads. As a direct result of experiments he made, New York City sewers were made available for the disposal of snow. Since 1920 he has been General Manager of Woodcrest Construction Company, Inc., which, among other projects, constructed Floyd Bennett Airport.

Ellsworth Luther Mills was graduated from the Civil Engineering course of The Cooper Union in 1910. From 1905 to 1913 he was Assistant Engineer for the Grand Central Terminal Improvements and Electrification. He was also engineer in charge of Design and Construction of track work for the New York Subway and Elevated System from 1913 to 1918. Various technical papers have been written by him. At present Mr. Mills is Vice President of The Bastian-Blessing Company of Chicago, Ill.



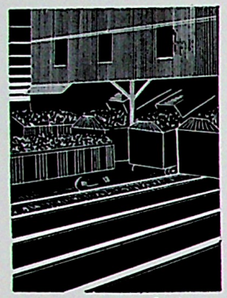
As a member of The Cooper Union graduating class of 1912, **Arthur R. Jensen** received his Bachelor of Science degree in Mechanical Engineering. In 1917 he received his M. E. degree as a result of post-graduate study at the Brooklyn Polytechnic Institute. Since 1906 he has been teaching Physics and Electricity at the Hebrew Technical Institute. Mr. Jensen is now head of the Science Department of this same Institute, teaching Applied Electricity and Radio.

Robert C. Coffin, a graduate of the Class of 1910 in the General Science course, re-enrolled at Cooper Union for a special Electrical course and received his E.E. in 1914. He is employed at present as Chief Sales Engineer in the Blue Coal Corporation of New Jersey.



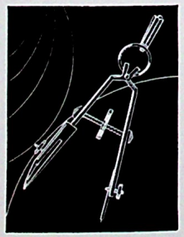
Anthony J. Daino was graduated from The Cooper Union in 1910 and received his C.E. degree at that time. He took post-graduate courses at Brooklyn Polytechnic Institute and later at Teachers' College. As president of the Slattery-Daino Company, Inc., of New York, he has directed and supervised the building of three City subways amounting to $12,000,000.00. On this work, Mr. Daino was Chief Engineer and General Manager responsible for the designing of the temporary street decking systems, side-bank shoring methods, under-pinning of buildings, and the general superintendence of construction work.

A GRADUATE of the General Science course of The Cooper Union in 1890, **Daniel B. Goodsell** has a long list of projects to his credit since 1894, at which date he started as Assistant to the City Engineer, Yonkers. The following is a list of his appointments: 1897-1917, in responsible charge of paving work for Borough of Manhattan; 1917-1920, Highway Engineer of Construction Division at Washington, D. C.; 1920-23, Service Engineer, Portland Cement Association; 1924, Senior Highway Inspector, Pennsylvania State Highways; 1925, Engineer on erection of Columbia Power House; 1925-31, supervising construction of bridges for Allegheny County, Pennsylvania, as an assistant engineer. Mr. Goodsell also attended a course in Highway Engineering at Columbia University.

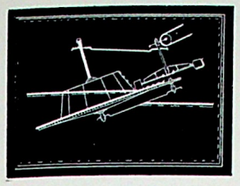


One of the graduates of The Cooper Union who has starred in the mining profession is **Robert E. Crockett.** He graduated in 1919 from the General Science course and shortly thereafter was employed by the Alan Wood Mining Company. He advanced himself steadily so that at the present time he holds the position of Superintendent of the Dover Division in Dover, New Jersey. Mr. Crockett is a co-writer of articles in the "Engineering and Mining Journal" for the months of April, May, June, and July 1932, on "Methods of Mining and Milling the Eastern Magnetites." He is also the inventor of the new Submerged Belt Concentrator for Magnetic Iron Ores.

AMONG those doing design, research and testing work in the Brooklyn Edison Company we note a graduate of and at present an instructor in The Cooper Union, **Werner O. Entenmann.** From the time he received his B.S. in 1920 to 1924 when he entered into the position which he now holds, he has been in the employ of the New York Steam Corporation as an assistant Engineer, of the Duquesne Light Company in Pittsburgh, of the Combustion Engineering Corporation as a Service Engineer, and of the Paper Utilities Corporation. He is an Associate Member of the A.S.M.E. and a frater in Sigma Alpha Pi.



Harold Burd Catlin was graduated as a Bachelor of Science in 1910 and took a year of post-graduate study at Columbia University. In 1915, he was given his Civil Engineering Degree by The Cooper Union. The various positions he held since leaving here make quite a long list. He was transitman and draftsman for Yonkers Water Works; in charge of party, and draftsman for Tenafly Drainage Commission; topographical draftsman for New York Public Service Commission and Brooklyn Bureau of Sewers; resident engineer at Hammond Steel Company, Syracuse; efficiency engineer, International Nickel Company of Canada; appraisal expert, Bureau of Aircraft Construction, U. S. Army; Assistant Chief Engineer of National Conduit and Cable Company. Since 1921, he has been Assistant Chief Engineer and Designing Engineer for the National Sugar Refining Company of New Jersey. Mr. Catlin is a member of the A.S.C.E., New York State and National Society of Professional Engineers, and is a registered Professional Engineer of New York State.



John Charles Riedel, a graduate of the General Science course of 1898, received his Civil Engineering Degree in 1904. From 1898 to 1935, he was assistant to Professor William A. Anthony of the Department of Electrical Engineering of The Cooper Union for nine years, and held the positions of Physics Instructor and Mechanics Lecturer for twenty-seven years in the Night School of Engineering. Mr. Riedel has achieved unusual success in his profession, working for the Edison Companies, serving as Engineer of Design for the Brooklyn Bureau of Sewers, and finally as Deputy Chief Engineer of the New York City Board of Estimate and Apportionment. He is a member of the A.S.C.E., and the American Association for Advancement of Science. Past President of the Municipal Engineers of New York, Brooklyn Engineers' Club, Cooper Union Alumni Federation, and the New York Association of Engineers, he is now president of the New York State Society of Professional Engineers. Mr. Riedel has written various magazine articles and has received numerous prizes for technical papers on Sewer Systems.

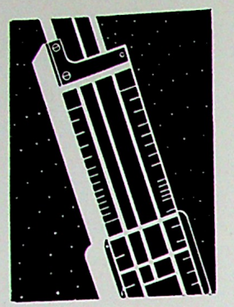
IN ADDITION to graduating from the Civil Engineering General Science course of The Cooper Union in 1909, **Morris Freed** was awarded his B.S. degree by the University of Southern California in 1917, also receiving the High School Teacher's credential in the same year. He has been teaching science and mathematics in the Los Angeles High School since 1917.

While attending The Cooper Union Night School of Engineering, **P. J. Magliato** was employed as Engineering Assistant with the Board of Transportation of the City of New York. He graduated with a degree of Civil Engineer in 1933. During the past three years he has been establishing an ever increasing and appreciative clientele as an insurance investigator and underwriter, in which profession he states, "I am proud to say that the Engineering training I received at The Cooper Union has been very useful."

Harry I. Krellen is a graduate of the Mechanical Engineering course, class of 1920. He is employed at present in the office of Engineer of Rolling Stock, of the New York Central System. He has made a considerable investigation of Railroad Engineering Personnel.

Samuel Gisser was graduated as a Civil Engineer from the General Science Class of 1918. He is at present among the thousands of men employed in the Engineering Division of the New York State Department of Public Works.

John W. Armbruster was graduated in 1927 from The Cooper Union Night School of Engineering, receiving the degree of Bachelor of Science in Mechanical Engineering. He is directly responsible for many important improvements in banking and accounting machines. Nursing a secret yearning for legal work, he studied law and is now Patent Attorney with the International Business Machine Company in New York, the largest organization of its kind in the world.



The Civil Engineering course which **Walter Jackson** completed at The Cooper Union in 1905, receiving his B.S. degree, gave him a solid foundation upon which to build. In 1902, two years after entering The Cooper Union, he started a seventeen-year career on the Electric Railway Journal (now Transit Journal), successively occupying the positions of assistant editor, technical editor, associate editor, business manager, and managing editor. Since 1919, he has specialized as a consultant on electric railway, motor bus transit, and matters relative to transportation rates.

AFTER graduating from the General Science course in Mechanical Engineering with the Class of 1908, **William I. Foster** returned to receive a B.S. in Electrical Engineering in 1911. He also took a course at New York University in 1916 on Sewage Treatment and Disposal. Since then he has participated in both the design and the construction of medium and large-sized engineering projects. He later devoted his time and attention to the inventory and appraisal of industrial and public utility properties. He is at present employed as an engineer at Allentown, Pennsylvania. Mr. Foster is an Associate Member of the American Society of Mechanical Engineers.

Gerald C. Glaser received his diploma with the Class of 1927, having completed the General Science course. He received his C.E. degree from The Cooper Union in the year 1931. For the past seven years, he has been employed as Principal Assistant to the Chief Engineer by the Slattery-Daino Company, Inc. Being a skilled engineer, he has been engaged in the construction of rapid transit subways for the City of New York under contract with the Slattery-Daino Company, Inc., Subway Contractors.

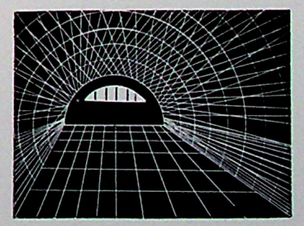
Upon graduating from The Cooper Union General Science course in 1913 and receiving both a B.S. and an M.E. degree, **J. O. Arkebauer** attended Columbia University 1913-14 and Brooklyn Polytechnic Institute 1924-26. At present, he is carrying on his own business as Consulting Engineer and Marine Surveyor, in addition to being sales engineer for several well-known firms. As an officer of the U. S. Navy, February 1917 to November 1919, he served as Machinery Inspector in the Port of New York and was in general charge of all classes of reconditioning and fitting out of vessels. He holds licenses as chief engineer and as professional engineer. When Honorably Retired October 1, 1935, he held the rank of Lieutenant Commander in the U. S. Naval Reserve and in the New York State Naval Militia.

Heathcote W. Lawson was graduated with The Cooper Union 1912 Class of General Science. As a specialist in structural design of welded steel structures, he recently supervised the erection of the all welded Bascule Bridge. He has been a Design and Erection Engineer of numerous New York buildings, including Roxy Theatre and the Chamber of Commerce Building. Mr. Lawson is the author of a book on welding standards and has recently written an article in the Journal A.W.S. on the theory of design in welded seat angles. Since 1931, he has been employed as an Engineer with McClintic-Marshall Steel Corporation.

Ludwig Mack of the General Science Class of 1925 received his M.E. from The Cooper Union in 1930. He has been in the air-conditioning industry for ten years, now being employed in The Cooling and Air-Conditioning Corporation and holding the position of Sales Engineering and District Manager in Philadelphia. During this period he has designed and erected many installations, including theatres, rayon mills, bakeries, tobacco and cigarette factories, paper and printing plants.

FROM the General Science Class of 1907, **Isaiah S. Abrahams** went on to post-graduate work at Pratt Institute, 1907-1908; Carnegie Tech, 1908-1909; Rensselear Poly, 1913 - 1914; C.C.N.Y., 1915 - 1917. He is now on the teaching staff of the Brooklyn Technical High School.

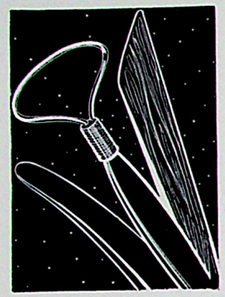
Sidney A. Ochs received his post-graduate M.E. from Cooper Union in 1934 and took additional post-graduate work in Patent Law and Chemistry at New York University from 1933 to 1935, after which he was admitted to the practice of U. S. Patent Law. He has had fifteen years experience in engineering design and research, and industrial management work. Several inventions pertaining to electrical recording instruments, high speed and aerial cameras, and naval ordinance instruments are credited to this enterprising member of the General Science Class of 1935, the Lambda Sigma Kappa Fraternity, and the Ex Post Facto Honorary Society.



In 1914 **Mr. Jacob Gertz** graduated from The Cooper Union after taking the General Science course in Civil Engineering and seven years later in 1921 he returned to get his C.E. degree. Although he worked on designs of reinforced concrete storehouses, airship hangars and steel mills, Mr. Gertz specialized in the last 14 years on development of mechanical handling for airships at the U. S. Naval Air Station, Lakehurst, New Jersey, where he is a structural engineer.

ART SCHOOL ALUMNI

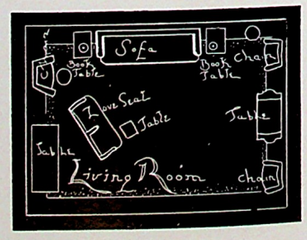
WITH the help of faculty and students, we have managed to compile some notes on the alumni of the Art Schools. For your enlightenment and edification, the stories of their success are presented on these pages.



Augustus St. Gaudens, a graduate of the Day Art School, is world-renowned for his sculpturing. Some of his most famous works include the "President Lincoln" statue in Chicago, "Diana" which formerly stood atop the old Madison Square Garden, the "Sherman" equestrian statue in Central Park, "The Puritan" in Springfield, Mass. and the remarkable statue of "Farragut" in Madison Square. His work embodies the best standards of French taste and method of execution without being hidebound by tradition. He has a style at once polished and free.

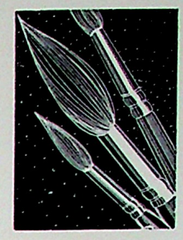
AMONG the outstanding achievements of **Leo Friedlander** are the Bas Relief in the National Chamber of Commerce, Washington, D. C., the central pediment of the New York City Museum, and two colossal equestrian groups for the Arlington Memorial Bridge. Among his awards he numbers the Prix de Rome, the Helen Foster Barnett prize, and the Silver Medal in the Sesquicentennial Exposition at Philadelphia. **Ellen Key-Oberg** and **Isabel Feltman** of the class of '34 and '35, respectively, have opened a studio on Fourteenth Street where they sculpt on a commission basis.

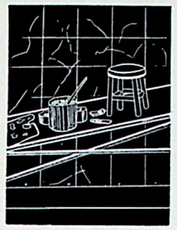
Adolph A. Wienman is internationally famed as a sculptor and designer. Winner of the Mitchell Vance prize, the Fine Arts Medal, the Gold Medal of Honor in Sculpture, and the National Arts Medal, he is well-known for his execution of the Soldiers and Sailors Monument at Baltimore, the Lincoln Rotunda of the Capitol at Frankfort, Ky., the facade of the New York City Municipal Building, and the dime and half dollar of United States Currency. Past president of the National Sculpture Society, Mr. Wienman is a member of the National Institute of Arts and Letters and the American Academy of Arts and Letters.



Esther Farb, a graduate of twenty years ago, has made quite a name for herself in the field of interior decorating. **Frieda Diamond,** class of 1924, was formerly a buyer at Stern's Art Department. She now has her own office as an Interior Decorator Stylist. **Elsie Wells,** a 1931 graduate, won second prize in the Sachs Foundation by decorating a room in one of the Sachs Furniture Stores. **Dorothy Knipper,** a graduate of the class of 1935, also won a second prize for decorating a room in another Sachs Furniture Store.

Luigi Lucioni is now an important painter whose work is in many school and museum collections, such as the Metropolitan, Whitney, Philips Memorial Gallery, and Victoria and Albert in London. He has been the recipient of many medals and awards. **Louise Braun** of the class of '28 won a traveling scholarship and has been represented at many exhibitions in the city. She is now working on murals for the walls and ceilings of a school for the elite located in Mount Vernon.





Ruth Light has been free-lancing since her graduation in 1927. Her work has appeared in the New Yorker and in the advertisements of several Department Stores, especially Gimbel's. She lived in Palestine, studying types and contributing regularly to the London Illustrated Weekly. Many exhibits both here and abroad have featured her work. **Xavier J. Barile** is one of the most successful artists of our day. Mr. Barile has had his portrait painting and landscape etchings and illustrations exhibited at the National Academy of Design, Anderson Galleries, Cincinnati Museum, the Italian American Arts Association, and the Art Students League.

Ursula Heinhold, 1929 class, is now a fashion illustrator and commercial designer. She is connected with out-of-town newspaper syndicates. Her specialty is the design of romantic costumes. **Docotoh Carlisle,** also of 1929, is now in Hollywood designing fashions for the films. **Adele Balkan** of the 1932 group is also in Hollywood working on theatrical fashions for Paramount. **Cornelia Cunningham,** '25 graduate, teaches art school in Atlanta, Georgia. **Margaret Cowan** has been a teacher in the life class in The Cooper Union for the past three years. Following her graduation in 1928, she won a traveling scholarship. **Betty Lewis,** besides taking courses in The Cooper Union, studied in Vienna and Poland. She is now an instructor at the Greenwich House in New York and is a member of the National Alliance of Arts and Industries. **Henrietta Schutz** was graduated last year and has been the assistant to Mrs. Harrison since then.

Bertha Entin of the '32 class, former salesgirl at Altman's, is now the assistant buyer. **Mary Greenalt** is the illustrator of many children's story books since her graduation in 1929. **Agnes Karlin,** '35, delights her sweet tooth by designing packages for Rockwood's Candy. **Marion Farries.** '33, is writing advertising copy somewhere in Florida. **Ada Kurtpatrisch,** '29, does the advertising layout and copy-writing for a large department store "down thar" in the wild and woolly "Lone Star" State of Texas.

THE theme of this volume gives an insight into the prospects of new graduates of The Cooper Union in the fields of Engineering, Architecture, and Art.

Bridge, dam, highway, and building construction; the development of airplanes, locomotives, automobiles, air-conditioning and Diesel engines; advances in radio, television, and the manufacture, transmission and conversion of electrical power; experiments in rubber, paints, ceramics, and especially metallurgy; the design of pre-fabricated houses, public and business buildings; pictorial design, advertising layout, and mural painting—all these activities offer the best chances of prosperity to this year's alumni.

The world is full of opportunity. It remains now for the new graduates, by achieving success in their chosen fields, to bring further glory to The Cooper Union.

CHEMICAL ENGINEERING

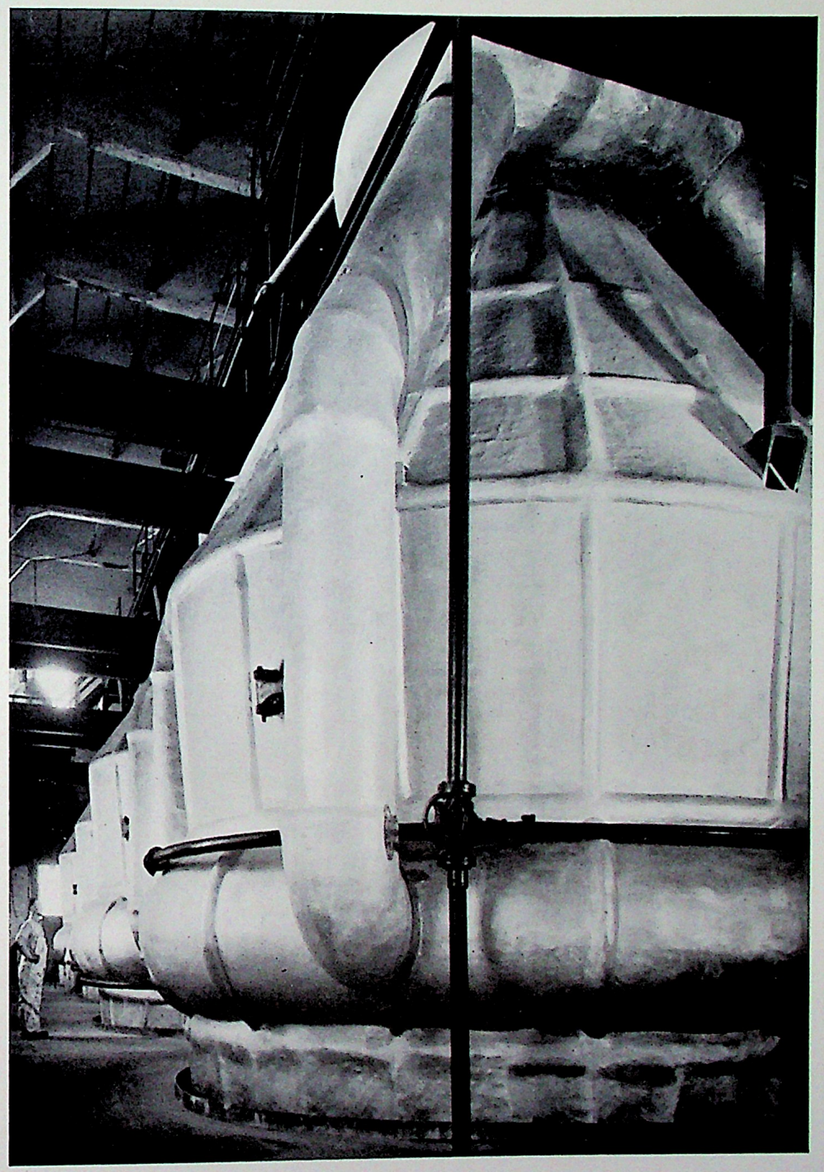
THE worker behind the scenes, the worker in the laboratory is often unknown and unsung. Years of research, long periods of study are often spent without practical result because they are lost in a maze of academic routine. Conscientious application by the chemical engineer has taken the findings of the test tube and the balance and has utilized them in all branches of engineering.

Roads have been made firmer by the noteworthy improvements in concrete; railways have been made safer by developments in the properties of steel; life itself has been affected by the versatile uses found for formerly discarded by-products. The creation of new rubber and cellulose products; the discovery of an improved process of automobile paint manufacture and application; the evolution of a new technique in acid handling; the solution of problems of gas and oil refining, and distillation—these are only a small part of what modern industry owes to the chemical engineer.

The increased erection of monumental structures has, however, necessitated the equivalent development of the basic material for these structures. From the earliest civilizations, cement, the most permanent of materials, has been the medium used. When the mighty pyramids were built, however, it took many months or even a year to acquire service strength; today it has been reduced to a matter of hours. Regulation time required in most engineering operations is twenty-eight days, but more recent methods reduce the curing period to a few hours where circumstances make quick-hardening essential.

Although cement has been used extensively for centuries, it was not until about 100 years ago that there were any manufactured or fired cements as they are known today. Only after the process of manufacturing cement was controlled, only after the chemical engineer analyzed the process and the product was it possible to effect this increase in the speed of production without loss in the quality of the product itself.

After repeated testing and re-testing the chemical engineer finally perfected a quick-drying cement which was first used successfully on the state highway in Maine in 1927. Since this first test in actual service was made, concrete of traffic strength has been produced, which was useable after twenty-four hours of hardening. The possibilities that this development offers in the rapid construction and prompt repair of highways, bridges, buildings, and other modern projects, mean a tremendous saving of time, money, and energy. In the recent construction of the George Westinghouse Bridge in Pennsylvania, the engineers, faced with an overhead of $1000 per day used 24 hour cement at the critical points. One hundred days and $70,000 were saved on this job.



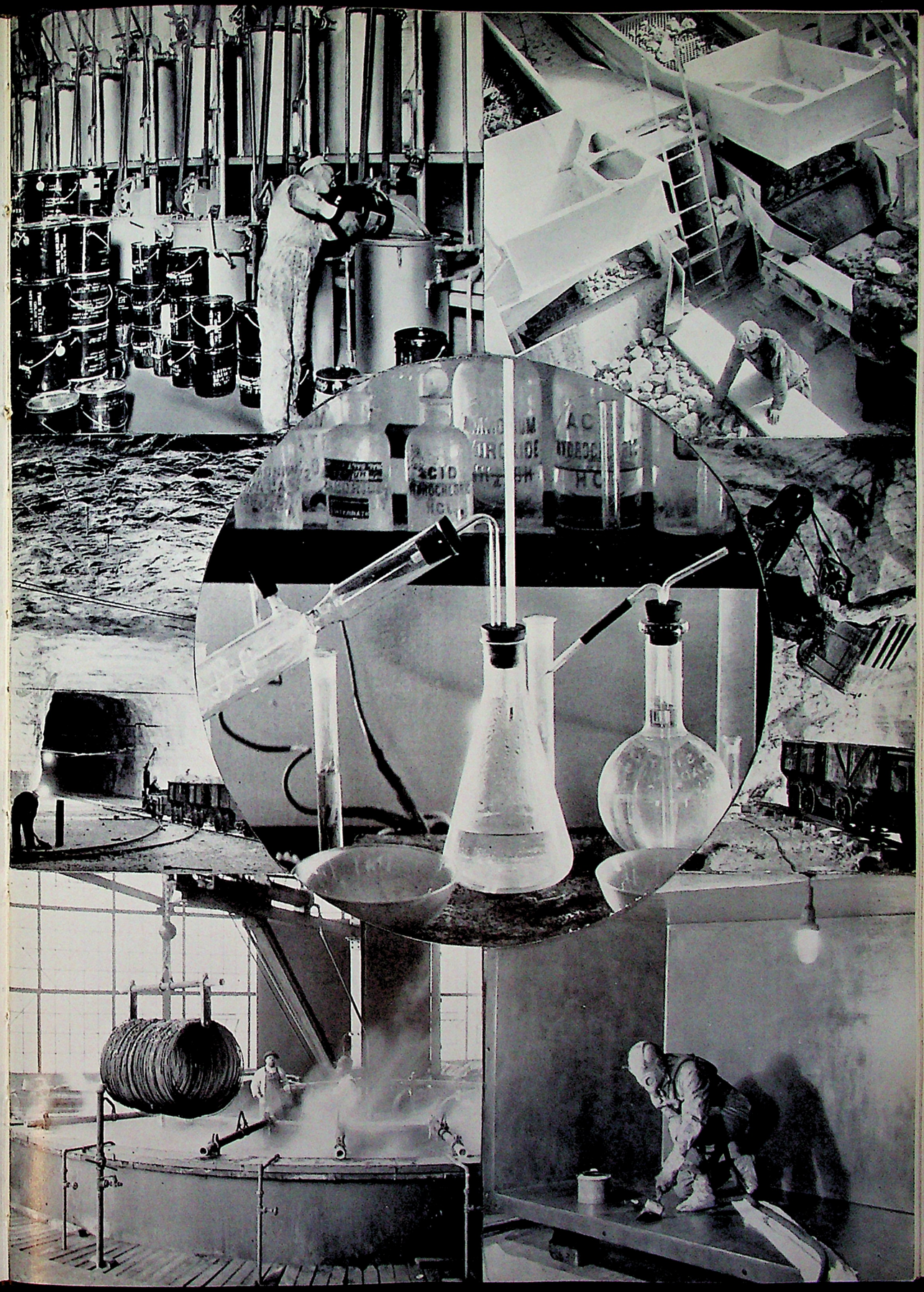
The perfection of an early strength concrete will have far-reaching significance. Given a new material, engineers will undoubtedly devise ways of making the most of it. The technique and design of roads, bridges, and other structures will be adapted to the shorter and more economical construction period. The work on this product proves again the interdependence of the various fields of engineering. As in this case, the work of the mechanical and civil engineer necessitates the improvement of a product by the chemical engineer; these improvements, in turn, broaden the scope of mechanical and civil engineering.

The horizon of the chemical engineer is an expansive one. In the discovery of new products, in more diversified application of known ones he has shown notable accomplishment. Rubber is a material which he has given extensive and unexpected utilities. Its manifold applications include process equipment for chemical and allied industries, such as rubber-lined tanks and rubber-lined pipe; packing for acid lines and corrosive gas service; hose and tubing for air, acid, water; new materials such as cellophane. The value of rubber in these varied uses depends not only on the peculiar properties of the basic substance itself but on its intelligent combination with other materials in making rubber compounds for different specific purposes.

A particularly interesting and important application of rubber has been realized in a new technique in acid handling. Handling acid for pickling has traditionally presented one of the most troublesome, costly and baffling problems of steel plant equipment. Until very recently leakage and failure of acid tanks and sewers, rapid corrosion of overhead structures, disintegration of foundations and frequent shutdowns for repair have been taken for granted as an inherent burden of pickling room operation.

Modern trends in steel production, involving huge investments in continuous equipment and smaller margins of profit, have focussed attention on these items of cost as never before. With heavy continuous equipment the preservation of foundation structures against disintegration by acid becomes vitally important. Of necessity a new technique and a new point of view in acid handling are developing. The engineer of today recognizes that acid leakage and the destructive effects of corrosion must be and can be prevented. The unique and versatile engineering material, rubber, is playing an increasingly important part in this prevention.

Several fundamental developments necessarily preceded the successful application of rubber linings to pickling tanks and auxiliary acid handling equipment. Ten years ago research chemists discovered a



process, whereby rubber and steel could be bonded. One additional element was necessary in the structure of tanks for pickling—a material strong enough to withstand the severe mechanical abuse to which pickling tanks are subjected. If the new lining was to be successfully used in steel pickling tanks it had to be protected in some manner from accidental violent contact with cradles, chains, or the steel being pickled. Brick, because of its known chemical permanence, physical strength and low cost, was the logical material to choose for this important part of the tank structure.

Hundreds of tanks of this type are now in active service. None have developed leaks or structural defects. In most plants they have earned their cost within the first year or two of operation. There has been a growing confidence among steel men that the wastes imposed by leaking tanks, corrosion and shutdowns for repair are definitely avoidable. This is the new point of view in acid handling. A new technique is developing, in which the research of the chemical engineer is a major factor.

Salt is accepted as a necessity for life. We rarely think of the part the engineer plays in its complicated and dramatic method of production. Vast mines are dug, deep wells drilled, strange new machines invented—all to make sure that salt is produced in quality and quantity to meet every need of every user.

The mechanical engineer frequently encounters high impact stresses in transportation equipment. The chemical engineer by analysis and research has evolved a high tensile steel the marked impact value of which provides the answer in meeting these unusual stresses. No one grade of high tensile steel would have a chemical composition and physical properties versatile enough to meet every conceivable requirement in the design and fabrication of all types of transportation equipment. Recognizing this, engineers and metallurgists have devoted extensive study to the development of various grades, specifically adapted to the requirements of this field. These high tensile steels reveal some very desirable properties. A slightly lower yield strength with improvement in ductility may be furnished; or a higher strength at a slight sacrifice of ductility can be supplied as desired, to suit the specific application. So, at every step, the chemical engineer is providing products, processes, and methods to enlarge the great scope of engineering possibilities.

His work is never done. As he looks beyond the present, he sees a steady reduction of the fuel supply in the United States. He will not be daunted. He has produced substitutes for many things; he will create new fuel materials.

ACTIVITIES

THE 1936 CABLE

With this the fourteenth edition of THE CABLE we present to you a continuation of the theme idea in your yearbook. The initial attempt to publish a volume of this kind was made in 1918 under the name of the COOPER COURIER. Year after year the COOPER COURIER grew in size from that of a souvenir program of the Annual Dance to that of a miniature yearbook in 1921. Too much cannot be said in praise of the conscientious workers through whose efforts these were successfully edited and published. The COOPER COURIER, however, did not fill the long-felt need of a real college yearbook befitting The Cooper Union's status in the collegiate world.

To supply this need and to provide the students and graduates with a memento of their college careers that will always live; to bring back memories of the best period of their lives—their college days, and their classmates; THE CABLE was originated in 1922. THE CABLE relates directly to the engineer and it commemorates the occasion of one of Peter Cooper's most notable achievements—his connection with the laying of the Atlantic Cable in June 1886.

The original issue remained the standard in presentation and composition with only minor changes from year to year until 1931 when the idea of a theme or story was interwoven throughout its pages. This plan has been followed through until the present because it has met with general favor among the student body and has given our yearbook favorable prestige and deserved praise from outside the college.

All previous CABLES were under the joint sponsorship of the Junior classes of the schools of Engineering and Architecture. The students of these classes were responsible for the financing and publishing of the book. It was their CABLE and they made the most of it. With the inception of the Blanket Fee this year THE CABLE becomes an all-school publication. Its staff is composed of students from six different classes in the four schools of The Cooper Union. Representation of classes in the volume was more equitably divided to make the book more desirable for the lower classmen. The stringent financial restrictions prescribed by the Blanket Fee Committee made necessary the exclusion of some elaborate features and the inclusion of certain other features which would insure wider interest and financial support.

Our theme, "The Engineer in the Modern World," is particularly appropriate at this time when the real place of the Engineer in society is being recognized and his service to mankind better rewarded. Today marks a great era in engineering achievement. The largest dam, the longest and deepest water tunnel, the longest bridge, the tallest building, the largest generators, the fastest airplanes—all are being created in our presence. The day of superlatives in the engineering field has arrived. The staff hopes that the theme material presented may help to engender in graduates and undergraduates a spirit of pride in the professions which they have chosen for their life work, and that this pride may be broadened to include their Alma Mater and their benefactor, Peter Cooper, through whose efforts they are enabled to secure their education.

Upon appointment as editors of THE 1936 CABLE, we inherited a tradition and the advice that there was a long and difficult task ahead of us. We thoroughly enjoyed the many months spent on the production of this volume. Our editor-in-chief and managing editor started work last July. Conferences with printers, photographers and engravers lasted through the summer. With the opening of school in September the staff was enlarged by the addition of Walter Govertsen and Frank Vanek whose assistance was invaluable. These four worked together side by side far into the night after school sessions and weekends to produce a CABLE worthy of its traditions. Our theme and its photographic presentation made necessary the selection of a certain type of art illustration that would not be incongruous with the theme. Erica Gorecki's scratchboard work was chosen as the most suitable for our purpose. Elbert Jaudon and Frank Kelemen performed yeoman service in gathering copy. Alfred Rathofer was called into consultation many times because of his familiarity with commercial art and engraving processes. Frank McGinnis and Bob Umbdenstock performed their duties well. Our comparatively small staff worked together as a cooperative unit.

Upon being relieved of our duties we deliver to our successors an enhanced tradition, an equipped, permanent office, and the material necessary for beginning work on subsequent CABLES. We hope that they will enjoy their work as much as we have enjoyed working together to publish for you THE 1936 CABLE.

THE STAFF

THE STAFF

CHARLES ALAN HAUCK
Editor-in-Chief

PHILIP EDWIN HAGERTY
Managing Editor

WALTER GOVERTSEN
Associate Editor

FRANK VANEK
Associate Business Manager

ERICA HANKA GORECKI
Art Editor

ALFRED A. RATHOFER
Architectural Editor

ELBERT W. JAUDON
Copy Editor

FRANK KELEMEN
Sports Editor

FRANK McGINNIS
Business Assistant

ROBERT UMBDENSTOCK
Editorial Assistant

EX POST FACTO

The Ex Post Facto Honorary Society of the CABLE was founded for the purpose of rewarding in some tangible manner the members of the staff of the publication. The small engraved key serves as a visible reminder to other students that the wearer was thus commended for his long hours of patient and persistent efforts to produce a CABLE of which The Cooper Union might be proud. It was the original intention of the founders of the Society to have the wearers of the Ex Post Facto Key advise and guide their successors in the production of future CABLES. This procedure has seldom been followed in the past but the increasing difficulties of the scholastic curricula will no doubt make such a system quite necessary in the production of subsequent CABLES.

1937

CHARLES ALAN HAUCK

Chairman

PHILIP EDWIN HAGERTY

ERICA HANKA GORECKI

ALFRED RATHOFER

WALTER GOVERTSEN

FRANK VANEK

1936

MILTON T. WAY

Chairman

GEORGE KLIGFIELD

1935

WILLIAM P. REUSS

Chairman

FRANCIS E. KNIPPER

GENERAL STUDENTS' COUNCIL

The General Students' Council is a representative body of the four schools of The Cooper Union, consisting of the presidents of each class in each school. The work of this Council is to bind together all the schools which heretofore had their own extra-curricular programs.

The Blanket Fee, though still imperfect, is a large step forward in this direction. Under this plan, each student receives a CABLE, a Pioneer subscription, an Athletic Association membership, and an Annual Dance ticket—all this at less than one-half the customary sum. The two Engineering and the Architectural Schools have unanimously supported the Blanket Fee. The Council hopes to improve the Blanket Fee to secure the endorsement of the Art Schools.

The Annual Dance, previously a Night Schools function, has been made an all-schools affair. The Committee is chosen from the four schools and is directly responsible to the Council.

The Council appoints two members to the Pioneer Board of Control which directs the policies of the paper. These members are accountable to the Council.

A constitution covering all activities in the schools has been approved through the efforts of a committee appointed by the Council. The Handbook, containing information regarding all student activity, is being completed by a special committee before the school year is finished.

The Gold "C," formerly a Night Engineering School award for participation in extra-curricular activity, has now been made applicable to the four schools. A new point system of distribution has been evolved to secure fairness in the awarding of this honor. With all its plans completed, the Council retires with a feeling of deep satisfaction.

Top Row—Gundlach, Hauck, Westman, Rathofer, Stanwyck, Adams, Dalton, Govertsen. Strauss. Bottom Row—Brown Davidson, Mikulka, Tracey, Gumbrecht, Williams, Hagerty.

BLANKET FEE

Lawrence Perez
Faculty Adviser

Charles Mikulka
Chairman

Abraham Patt
Member

Frank Kelemen
Member

For years the dream of student leaders at Cooper Union has been the institution of a blanket fee to finance all extra-curricular activities. Such a fee would automatically place these activities on a sound basis where budgets and plans could be drawn up in advance and no time would be wasted in soliciting student support.

Finally, the precarious condition of the various activities in the Spring of 1935 forced the General Students' Council to the realization that something must be done. Every year, more and more organizations were being abandoned as student support faded. The Athletic Association, formed three years ago by merging the Day and Night organizations, was reduced to a mere skeleton. The remaining activities: the Cable, Pioneer, and Annual Dance were just existing.

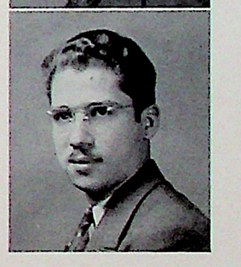
The action of the Council took the form of a committee headed by George Nagoshiner to investigate the possibilities of a blanket fee. After minute investigation, the committee reported that if the entire enrollment of the Day and Night Engineering Schools subscribed to a blanket fee of four dollars, the financial requirements of all the activities could be met. This four dollar fee would cover membership in the A. A., subscription to both Cable and Pioneer, and a ticket to the Annual Dance—a total value of eight dollars.

With the consent of the Faculty, the committee then decided to poll the student body to determine its reaction to such a plan. If more than sixty percent of the enrollment of one school voted in its favor, the Faculty would make the Fee compulsory for that school beginning in the Fall of 1935.

The result of that poll is history. The Night School of Engineering passed the plan with a majority more than necessary, and the Institute of Technology accepted with an overwhelming aggregate. The Blanket Fee thus became a reality, and when the incoming Freshmen voted in its favor in September 1935, the members of both engineering schools were wholly behind it.

The Student Council was now faced with the gigantic task of organizing the set-up under which the extra-curricular activities would operate with the Blanket Fee. Six members were appointed to the Blanket Fee Committee: Charles Mikulka, Abraham Patt, and Frank Kelemen of the Day School; Frank Tracey, James Gill, and William Quick of the Night School. Mr. Lawrence Perez accepted the position of Faculty Adviser. Later, Irving Friedman was appointed to represent the Architectural School which also agreed to the plan and Sidney Swertloff was selected to act as Publicity Manager.

COMMITTEE



Frank Tracey
Treasurer

James Gill
Secretary

William Quick
Member

Irving Friedman
Member

With Charles Mikulka as chairman and Frank Tracey as treasurer, the Committee set to work, developing into the hardest working group that Cooper Union has ever seen. With approximately a thousand students in the engineering schools, the Committee had first of all to collect the fee from each man. It had to devise a bookkeeping system, receipts and membership cards, and decide the cases of students pleading for exemption because of financial hardship.

In order to decide the matter of exemptions, the Blanket Fee Committee found it necessary to appoint two committees, one to act for the day school and the other for the night school. The members of the Day School Exemption Committee are Hylas Smith, Harold Silvers, Sheldon Lang, and Royes Salmon, and the Night School Exemption Committee consists of Anthony Ancona, Herbert Bahrenberg, and Alexander Segalman, with Lawrence Perez as chairman of each. The members of these committees were tactful but firm in their decisions on all cases presented to them. They are to be complimented upon the discretion and finesse with which they discharged their duties.

Being trail blazers, the Committee had to learn from hard experience. Not being allowed to demand payment on the opening day of school, the Committee collected immediately whatever it could and asked the remaining students to sign pledge cards—a mammoth task in itself. Relying chiefly on the mediums of newspaper and bulletin board notices instead of direct contact with the students, the Committee did manage to have practically all the men pledged before Thanksgiving. The collections were taken at the same time and were completed before the Christmas holidays.

Through the cooperation of the 1936 CABLE staff and the Annual Dance Committee, the Blanket Fee Committee was able to produce a substantial surplus. This fact, coupled with the benefits derived by the extra-curricular activities, make the Blanket Fee almost certain to be continued as a permanent institution.

THE PIONEER

Bernard Schenker
Editor-in-Chief

Frank Kelemen
Business Manager

Eugene Michaels
Associate Editor

Sid Swertloff
Assistant Editor

The gleaming eyes of a dozen chandeliers gazed coldly through a curtain of cigarette smoke, to look upon a scene of feverish activity in the bowels of the Hewitt Building. A score of slaves was devoted to the task of grooming the Pioneer for its weekly appearance. A determined stranger stepped into the Mazda glow, fascinated by the jittery writers' pencils dancing on yellow carpets and making whirls and eddies in the pall of smoke, accompanied by the staccato stutter of a typewriter duet.

"Come in, Brother Cable," greeted the genial Pioneer in recognition. "Come in and sit down. If there's anything I can do, I'm at your service," he added graciously.

"I've come for my yearly interview, Brother Pioneer," returned Cable.

"Well, Cable, I'm not used to being interviewed, as you probably know. I feel better interviewing, but if you insist—."

"Thanks. You see, you come out once a week, tell us about everything and everybody, and then disappear for another week. I'd like to know something about your life during the week; I want to go backstage with you and see you as yourself. In short, tell me everything."

"Very well, Cable, but remember you asked for it. First, about myself. I live and exist for one thing only—my student public. Neither snow nor rain, nor heat nor gloom of night, stays me from appearing regularly to serve them. Without them, you see, I'm nothing at all, so there's none of me which exists for any other purposes but theirs. And they themselves give me life to serve their particular ends.

"Now, I'd like to be like an ever-blooming wildflower—to be enjoyed by anyone at any time without effort or thought as to my origin and growth, without a care as to my why or wherefore. However, I'm really a hothouse flower. I must have hours of attention and all sorts of care; the more is given me, the better I look. These dutiful minions you see strewn about are my devoted faithfuls, giving nobly of their hours and talents, that I might go forth proudly, and confident that I am as good as they can make me. It is of this kind of stuff that I am made—duty, devotion, plenty of work and sweat; much more than paper and type and plain black ink. Whenever I come out, it is because of my human slaves, who have uncovered news events of importance and have prepared them for me to present in their best form."

"I think I understand very well, Pioneer How have you been treated this year?"

"Not badly, Cable, but not perfectly either. Just before Christmas my editor-in-chief, Joseph Maltz, had to resign because he was giving me too much attention. My retinue isn't quite so expansive as it might be, and so he was wasting weekends on menial tasks. Replacing him, Bernard Schenker was moved up one notch to the top, and Eugene Michaels took his place as associate editor. Then a comprehensive shake-up served as a good tonic."

"What about these news events you mention?"

"For one thing, there have been more of them this year then ever. I had six pages almost every week, and drawings and photographs were quite numerous. Incidentally, I got myself a new printer at the very beginning. A Serbian newspaper took me in hand, though luckily no Serbian ever slipped into my pages.

"Scholastic news was well represented by the new Professional Aspects classes, in which speakers from industrial fields lectured on topics esoteric to the technical world. Then we had instructors promoted to Professorships. Upon the regretted and untimely death of Professor Rossmassler, Assistant Professor Young was again honored, becoming the acting head of the Department of Machine Design.

"In the Day Art School much was ado this year. Their hours were changed to eliminate lateness in the morning, and the lunch hour was postponed to correspond with that of the Engineers. The Artists organized Dramatic and Fencing Clubs, and the Glee Club continued. Then Art School activities were put under the jurisdiction of the Faculty Committee on Extra Curricula Affairs. Tekart dances and the Junior Masquerade passed through my headlines. And best of all, the Annual Dance, and the Founder's Day Dinner.

"The General Students' Council was very much with us right along. The Blanket Fee Plan was revised to better perform its duties and submitted to the students for their vote on its continuance next year. The Gold "C" Committee formulated a plan for point awards for extra-curricular work, setting definite goals for those who aspire to the honor of earning a Gold or Silver "C." Constitution consciousness became generally prevalent, resulting in the creation of those wordy documents to define the duties of the Student Council itself, the Athletic Association, and probably one or two other organizations that I've forgotten about by now. And the Council constitution expects fo find itself in the new and needed Student Handbook, which in turn, expects to find itself in the hands of next year's freshmen if financing difficulties are overcome.

"The Varsity Basketball Team, the Rifle Club, and numerous interclass contests provided yards of copy."

"I heard something of an organization within your organization. Could you clarify that?"

"That's Lambda Tau, the newly organized honor society embracing those of my literary tribe who consider journalism an art worthy of the time and talent they bestow upon me, that I might live. Membership in this society is an honor won by a limited number of the best workers on the staff each year. This organization is still in its infancy so it hasn't had a chance to show us its worth. But you just wait and watch."

"I'll ask about it next year, Pioneer. Good Luck!"

LAMBDA TAU

The Board of Management of the Pioneer has organized an honorary society for the purpose of suitably rewarding those members of the student body who give their time and effort to producing the student newspaper.

The purpose of this organization is to promote cooperation and friendly relations among the members of the staff of the Pioneer, and to endeavor to develop the highest standards of college journalism.

The constitution and plans for this society were discussed by members of the staff last year. The only active members of Lambda Tau still connected with the paper at the beginning of this year were Frank Kelemen, Bernard Schenker, S. Q. Swertloff and Erica Gorecki.

There are two types of members in the society, active and honorary. Honorary members are those formerly active on the Pioneer staff who no longer take part in the production of the paper. These are Abe Patt, Louis Schramm, A. Byron Greenberg, Jack Sonberg, Charles Mikulka and Joe Maltz.

At the first meeting of the society held on January 10th, the charter members voted to include Dave Klein, Palmer Allen, Allison Scott, Elsie Fischl, Jerry Sanders and Sheldon Lang on the rolls. There will be another vote held at the end of the year, when it is hoped that the ranks will swell to fifteen or twenty active members. They will then be entitled to take part in the activities of the organization and to wear its insignia. The only reward gained in the past years by working for the paper was personal satisfaction, and it was to give material recognition for such work that this organization was formed.

Chancellor
FRANK K. KELEMEN

Vice Chancellor
BERNARD SCHENKER

Exchequer
SID Q. SWERTLOFF

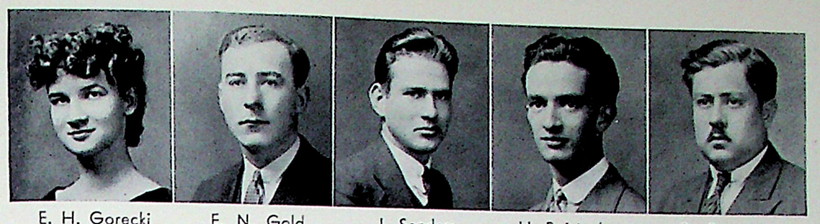
Recorder
ERICA H. GORECKI

Honorary Members

JOSEPH M. MALTZ
ABRAHAM PATT
LOUIS SCHRAMM
CHARLES MIKULKA
A. BYRON GREENBERG
JACK SONBERG

Active Members

DAVE KLEIN
SHELDON LANG
JERRY SANDERS
ELEANOR P. ALLEN
ELSIE J. FISCHL
ALLISON W. SCOTT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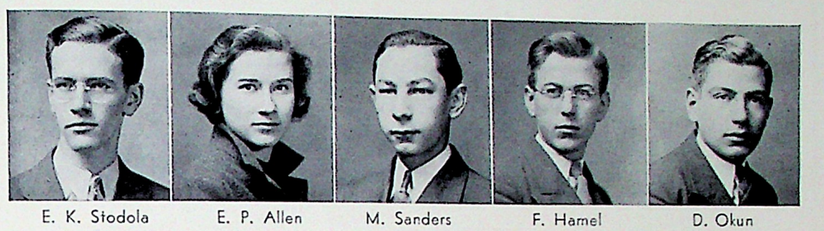
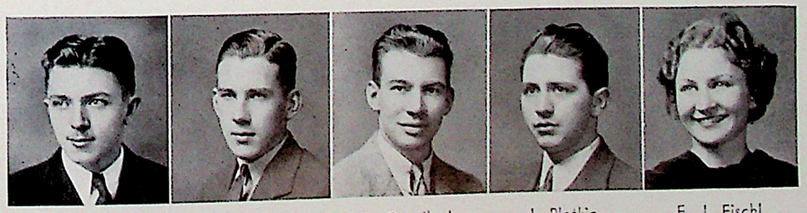

E. K. Stodola | E. P. Allen | M. Sanders | F. Hamel | D. Okun

P. E. Hagerty | H. Woebke | T. Woodcock | H. Bahrenburg | H. Robbins

C. Mikulka | S. Lang | C. Samberg | A. Scott | J. Stengren


J. Schwartz | J. Allaire | R. Gundlach | I. Plotkin | E. J. Fischl

ATHLETIC ASSOCIATION

Michael Aruck
President

Bernard Schenker
Vice-president

Frank Kelemen
Secretary

Charles Hauck
Treasurer

With the beginning of this scholastic year, the officers of the Athletic Association assumed their positions with the hope of guiding the Association to new heights. In the previous two years athletic activities had received a great impetus through the aid of the General Science Alumni Association. The inauguration of the Blanket Fee with the consequent five-fold increase in membership and improvement of financial status promised a heretofore unheard of development of athletics at The Cooper Union.

This year again the use of the Christadora House gymnasium and swimming pool were secured. In order that varsity basketball practise might not interfere with intramural contests, the A. A. officials obtained the facilities of P. S. 60 for the varsity teams. This court has proved unsatisfactory because of its low ceiling which prevented the squad from securing any practice in foul shooting. This placed the team at a decided disadvantage which was very apparent in the first few games that were played. However, they were undeterred by this difficult situation and plunged eagerly into their schedule which this year was far more arduous than ever.

Intramural contests in basketball, swimming, and water polo were again organized this year. Lower classmen were particularly enthusiastic about the basketball matches since they were able to lord it over the high and mighty seniors who with difficulty were able to round up five decrepit players. Water polo was also very popular, giving the fellows an opportunity to work off excess energy by half drowning each other. The swimming meets allowed the human fishes to display their prowess.

The Rifle Team, which last year was forced to retire from intercollegiate competition because of the lack of range facilities, was this year again faced with the same difficulty. Matters looked very discouraging until just a week before matches were to begin, when a suitable range was secured at the Army Post on Governor's Island.

With the present facilities it will be possible to organize teams in boxing, wrestling, and other sports. Offers of competent instructors have been made by the Athletic Director at the Christadora House. With student support, athletics may thus be raised to a pre-eminent position in extra-curricular affairs.

VARSITY BASKETBALL

Basketball has this year again proved to be the most popular sport in The Cooper Union. With the opening of the season, twenty men, the majority of whom were from Day School, answered the call for candidates. Included in this group were six veterans and a number of excellent prospects. With the squad again under the guidance of Coach William G. Lamb, who has coached basketball in Cooper for five years, a formidable team was promised.

In the previous year the team was able to practise only once a week because the same gym was also used for intramural sports. This year a separate gym was secured exclusively for the varsity, enabling them to have more time for drill.

After the first few sessions, the squad was cut to eleven players and the men then settled down to rigorous training in preparation for the tough schedule ahead of them. The coach worked out a tentative first team with Lang and Block as forwards, Cohen and Mikulka, guards, and Johanny, center. All were veterans except Cohen, who stood out for his ability to drop those long set shots. Contesting spiritedly for the varsity berths were Lipshitz, Mahoney, Eichenbaum, and Skorski.

The campaign was opened against Long Island University, one of the most powerful teams in the East. It was a foregone conclusion that Cooper would lose, but our boys didn't lay down on that account. They fought furiously, though bewildered by the power and shiftiness displayed by the veteran L.I.U. aggregation. With the final whistle our quintet found itself on the short end of a 56-13 score.

In the second game on the schedule, we nosed out Columbia College of Pharmacy, beating them 25-24. The contest was nip and tuck all the way, first one team and then the other scoring. In the closing minutes of play, Cohen dropped the deciding basket, giving us the game.

Brooklyn Polytechnic Institute, our traditional rival, furnished the next opposition. This was an exciting, hard-fought game, with the two teams matched as to playing ability. However, our five's lack of practise in foul shooting lost us the contest. Poly's superiority in this respect was the factor that gave them a victory. The final score was 31-26.

The evening after the struggle with Poly, our quintet met Fordham University. The Fordham court is much larger than the ordinary one and the boys, tired from the previous night's battle, were unable to do more than jog up and down the length of the floor. The final score was Fordham 38 and Cooper 14.

The Cooper five travelled out of town for the first time to play Panzer at East Orange. The Maroon and Gold showed impressive form, completely outclassing their opponents for most of the game and running up a twelve point lead. Near the end, however, their lack of conditioning began to tell and they just managed to squeeze through with a 24-22 victory, the second of the season.

The seventh game was played against the New York Aggies. This contest was a heartbreaker. After a closely fought, nip - and - tuck battle, the squad was much chagrined to lose the game by one point, the board reading 25-24 at the final gun.

The Cooper basketeers next met Stevens Tech. The boys showed the way for almost the whole game but allowed Stevens to come up in the last minute and make the score 25-all at the final whistle. We lost the game, being unable to score in the overtime period, while the opposition tallied six points. The team also lost the next game with Savage, being outclassed to the tune of 41-27.

The tenth game gave our quintet the opportunity to break a three-game losing streak. Displaying real teamwork, they decisively defeated Brooklyn College of Pharmacy by a score of 33-25.

Rutgers Pharmacy nosed us out in the next game by three points. It was an exciting contest, with first one team and then the other forging ahead. However, our quintet's inability to sink easy set shots proved the margin of defeat.

Another close game was lost to Newark College of Engineering by the score of 27-25. The game was loosely played, many shots being missed by both teams. In the third quarter our outfit came to life and ran the score up to 25-24 in favor of The Cooper Union. With less than a minute to play, Newark scored a basket and a foul to snatch the victory.

Webb Institute of Naval Architecture proved an easy victim. Playing as a well-coordinated unit, our team baffled the opposition, emerging victorious by a score of 33-22. Lang proved the star of the evening, making 12 points, the most ever tallied by a Cooper player any one game this season.

With advancement of the season, the team has shown constant improvement in form and has an excellent chance to win the few games remaining to be played this season. Prospects for next year are particularly bright, with the squad expected to lose only two men, Charlie Mikulka and Dave Lipschitz, who graduate this year. The rest of the team are Juniors and Seniors in the Day School and three fast men in the first three years of the Night School. This means that for the next three or four years enough veterans will be on hand as key men around whom the coach can build his squad.

Arrangements are being made to secure the use of a suitably equipped gymnasium for next year's Varsity. With such an opportunity the team can be given a much better training in all the phases of basketball. With a good gymnasium the team will have several home games. Although the student representation has been far below normal it is hoped that at these games the team will be given adequate support by a crowded cheering section.

INTERCLASS BASKETBALL

Once again this year, the day Tech classes were the only groups in The Cooper Union which selected teams to participate in the round-robin basketball tournament. The classes of the Night School of Engineering did not respond to this sport as well as they did in the water games and were, therefore, not represented in any of the interclass basketball contests.

The Freshman basketeers, to the utter amazement of all the other classes and to the delight of the spectators, won two of its first three contests. For a Frosh five, this was absolutely unexpected and positively rude. However, it did have one good effect. The Sophs were made to sit up, take notice, and get some much-needed practice. The playing of Howie Kutzleman and Harry Donnelly acted as the sparkplug for the Frosh quintet.

The Sophomore five is really good. Because of some bad breaks, their sincere efforts have not met with much success. Dan Ozvath, who is also the manager of the Soph team, is one of the best players participating in the tournaments. He is fast, shifty, and can lay them up as well as the best.

When the Sophomores met the Juniors in the tournament on January 7th, the meeting renewed hostilities which had begun in the interclass contest of the previous year. The Junior dribblers, smarting under the ignoble defeat of the year before, came up out of the trenches with guns blazing, and routed the bewildered Sophs with a score of 38-11, a lead of twenty-seven points.

The Junior squad (arise and shine, boys!): Al Kranoff, Elmer Kutzleman, Walter Bass, Pete Koleshnikoff, Al Chen, Frank Kelemen, Noah Gould, and Dan Okun, are top-notchers. To date, they have a total of four victories and no defeats to their credit. Kranoff, Kutzleman, and Bass are a trio who as yet have not encountered any real opposition from any opposing team. Mr. Laub, coach of the varsity basketballers, might find it well worth his while to have a look at these men in action.

The poor, decrepit Seniors who, so they say, were the 1935 champs, did not stand a ghost of a chance in this year's contest. Their inability to collect enough men from which to select a representative group, coupled with the loss of their two best players, Lipshitz and Shapiro to the Varsity, made their athletic powers dwindle away to a mere nothing.

With all these things taken into consideration, the Juniors firmly believe that the 1935-36 Interclass Basketball Champions will be the Class of 1937, which is an extremely subtle method of saying, the present Junior Class. However, this is the opinion of one class. If they were to boast so much, they had better be sure of victory or defeat may be so much more bitter. Let it be hoped that the Sophomores will show their mettle in the few remaining games for it is really an insult to them to let the Freshmen beat them. For the games remaining, the eyes of Cooper Union are interestedly watching to see if the Sophomore spirit will rise to show its power.

RIFLE CLUB

With the permission to use the facilities of Governor's Island, new life has infused The Cooper Union Rifle Club. The use of these ranges was only procured after a great deal of negotiations between the Riflemen and the Army. Now, having disposed of miles of red tape, the nimrods are enjoying the convenience of Governor's Island, the present station of the 16th Infantry.

With a range provided for, the squad is sending into intercollegiate circles a varsity team which will endeavor to uphold the honor of Cooper Union. The team's schedule this year includes some formidable rivals. Teams such as City College and N.Y.U. who have the Reserve Officers Training Corps in their curricula have a decided advantage over our teams. Brooklyn Poly has its own range and has retired army officers to coach its team. Here again is a team which will be an almost insurmountable obstacle.

The final flourishes of The Cooper Union sharpshooters will occur at Annapolis on April 4th. On this date the annual intercollegiate shoulder-to-shoulder match will take place. This event is always anticipated by the members. There is a certain thrill to be gained from visiting the National Naval Academy—tradition, historical significance, uniforms, stirring songs and marches—all these set in surroundings of beauty and dignity lend a glamour to the occasion.

Although the Rifle Club did not obtain the use of their present range until February 1st, they did not enter into competition entirely unprepared. During the summer and fall, various members spent their weekends at the Ossining Rifle Club in north Westchester county. At this range, the members shot on a long range of 100 yards. Although six times as long as the official intercollegiate small-bore range, the practice they obtained was good experience for the Riflemen.

Copy for THE CABLE is submitted rather early in the year, and so no results of the Rifle Team's matches may be obtained. However, the team is optimistic and hopes to show that they really can shoot—that there are some individuals in its midst who are truly marksmen.

WATER POLO and SWIMMING

After one of the closest tournaments in which Cooper Union students ever participated, the Senior Class swimming team emerged victorious, just ousting the Juniors by a margin of four points. One of the major upsets of the swimming carnival was the placing of the Night School Swimming Team. This year, the first year in which the Night Engineers sent out a swimming team, these men tallied nearly fifteen points to take third place. Since classes in the Night School begin at 7:00 p.m., it was necessary for some of the contestants to leave before the tournament was over. At the last event—a four-man relay—two night men remained, who, despite this handicap, captured second place in the event.

In addition to the usual events of a swimming meet, this year's tournament had a number of other events. There was a three-man medley relay in which each team had a man swim one lap backstroke, a second man swim breaststroke, and the final man swim freestyle. The plunge and underwater distance swim were some of the other events. The most humorous incident of the evening was the candle race in which each competitor had to carry a lighted candle from one end to the other end of the pool. Flying spray caused by the plunging and plowing of many feet extinguished most candles before the race had progressed barely five feet.

Since the Water Polo tournament has not, as yet, begun, one can only conjecture as to the probable outcome. Offhand, one would say that either the Juniors or Seniors would be the winner. Nevertheless, a careful observer will not be so bold as to entirely overlook the Freshman and Sophomore teams nor forget the surprising upset nearly pulled off by the Night School. Their near-victory under bad handicap may encourage them to greater efforts. Whether or not the Seniors will continue to show their superiority over the other teams will be ascertained when the Water Polo Tournament gets under way. Last year the present Junior class won the swimming tournament and continued to show their ability in the Water Polo Tournament in which they remained undefeated. Although the Seniors consider their winning the swimming meet as a sign of continued success for the remainder of the year, they will find themselves with a tough assignment to fulfill. Time alone will determine if the Seniors succeed.

ATHLETIC C AWARDS

There are a number of students who in spite of crowded scholastic schedules, and in the case of a few the necessity of earning a living, find time for extra-curricular activities. For these men who render service to The Cooper Union through the medium of their participation in intercollegiate competition the Athletic "C" award has been established.

BASKETBALL

MAJOR "C"

Charles Mikulka
Sheldon Lang
Arnold Johanny
Meyer Block
Maurice Lipshitz

MINOR "C"

Charles Samberg, Mgr.

Al Skorski
Julius Cohen
David Horowitz
Max Axelrod
John Kennedy
Abraham Leventhal

RIFLE

MAJOR "C"

Charles Stumpp
Bernard Schenker
John Weber
Frank Kelemen
Robert Gerhold

MINOR "C"

Hyman Turkin
John Pierano
Peter Kolesnikoff

HONOR C AWARD

Throughout every school year we find a comparatively small group of students who are willing to sacrifice a little more effort than that necessary to acquire an education—and be cheerful while doing so. These men receive no material compensation for the inestimably valuable benefit the student body as well as the school gains through their endeavors.

As in other schools and organizations these few men are the spark necessary to set and keep the machinery of extra-curricular activities in motion.

Since there are many of these men unsung and unknown, the Night Engineering Student Council of a number of years ago instituted the Gold "C" Honor Award to be given to these men in recognition of the services they render. In 1935, the General Students' Council, including representatives from all the schools that comprise The Cooper Union, established the Gold "C" as an all school award to be given to any deserving member in the entire institution. Today it is the highest honor award which can be conferred upon a student by the student body—one which any person may be justly proud to wear.

SILVER "C"

Eugene A. Kelly
Charles Mikulka
William S. Quick
Frank A. Tracey

GOLD "C"

Eleanor Palmer Allen
Irving Friedman
Walter Govertsen
Erica Hanka Gorecki
Philip Edwin Hagerty
Charles Alan Hauck
Frank Kelemen
Joseph Maltz
Alfred Rathofer
Bernard Schenker
Sid Swertloff
Frank Vanek
Nathan Wald
John Westman

MATHEMATICS CLUB

Hyman Turkin
President

Leo Schumann
Vice-president

Norman Iskowitz
Secretary

George Karnofsky
Treasurer

The Mathematics Club of The Cooper Union Institute of Technology is a unique organization among The Institute's clubs, being the only one engaged in the pursuit of the abstract for its own sake. Although mathematics in all aspects is considered as lying within the limits of the club's endeavor, certain aspects are developed more in detail owing to the propensities of the members.

As a matter of custom, the program of the club always has as its first object the teaching of the use of the slide rule to freshmen. Following this, the trend of the lectures is more toward the theoretical and the novel. In the past, topics have ranged from the extremely abstruse topics of Topology and the Theory of Geometry to the extremely practical topics of Operational Calculus and Dimensional Analysis, and the lighter recreations and applications of mathematics.

There were always more papers to be presented than time permitted. For this reason many fine, original works could not be delivered at the regularly scheduled meetings. The best prepared and most generally interesting papers were given preference and the others were held in abeyance for future presentation. It is hoped that suitable arrangements may be made to hold meetings more frequently in order that the members may be able to listen to many lectures of a highly interesting nature.

The club serves another incidental purpose in sponsoring student papers on suitable topics, thus introducing the student to original work for the lecture floor. It has been the policy of the club in the past to have as many student speakers as possible.

The organ of the Mathematics Club has had a rather haphazard existence in the past few years, but it is probable that it will again be published beginning this year or next. In the next number it will be possible to include the accumulation of several years of fine work on original topics.

In its work the club has had a rather easy task, for there was no need to arouse an interest in the topic. The interest was present—all that was needed was the means of fruitfully employing it in the pursuit of knowledge. It is in this capacity, of applying the amateur quality of an art to the development of a science, that the Mathematics Club of The Cooper Union Institute of Technology enjoys its true function.

AMERICAN SOCIETY OF CIVIL ENGINEERS

Professor F. Foss, Faculty Adviser

Frederick Baptista
Chairman

Charles Duffy
Vice-chairman

Daniel Okun
Secretary

Sanford Koretsky
Treasurer

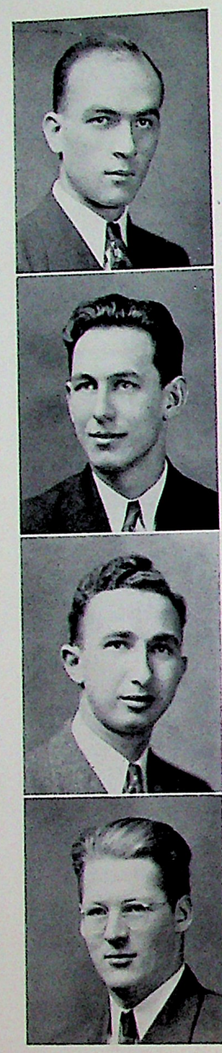
It has been the purpose of The Cooper Union Student Chapter of the American Society of Civil Engineers to bring to the student those phases of engineering endeavor which are not treated in the prescribed curriculum. It is not possible for the faculty, in the short time at their disposal, to bring to the student more than the barest fundamentals. A working knowledge of the application of the theories and principles to engineering practice is of prime importance. The value to the student of acquaintance with these methods rather than with textbook formulae, cannot be overemphasized. With this in mind, the officers arranged a program of activities that would help fill the gaps in the engineering education.

It is hardly possible in the limited space available to detail the activities of the chapter during the past year; consequently, only a few of the highlights will be discussed. The subjects of the lectures were varied and more interesting. Most of the lectures were illustrated with lantern slides or motion pictures. Among the lecturers were Mr. J. Hadden, a prominent consulting engineer, who is one of the inventors of the crescent type stadium; Mr. Charles L. Crandall, resident engineer on the Midtown Tunnel, who described graphically the methods employed in "holing through" under the Hudson, and Mr. John W. Pickworth, consulting engineer in the construction of the Hayden Planetarium. This last topic was of especial interest because the concrete-shelled dome is new to American construction methods. These and the other speakers are authorities in their various fields, and known to be high in the engineering profession.

An integral part of the activities of the chapter were the two Metropolitan Conferences. These were meetings of the chapters of all the recognized engineering schools in New York. Other events during the year were inspection trips to nearby projects and plants. The school year and the program of the chapter were terminated in May with a banquet.

It is hoped that the school year 1936-37 will show an increase in interest by eligible students with a corresponding increase in the number of members in the Society.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS



Max Yesowitz
Chairman
Charles Mikulka
Vice-chairman
Morris Welling
Secretary
Cornelius Kirby
Treasurer

Asst. Professor Herbert F. Roemmele, Faculty Adviser

The A.S.M.E. Student Branch activities of 1935 were outstanding in the Chapter's history. When the Mid-Eastern Group of the Student Branches held their convention here in New York, Cooper Union played host to the seventeen colleges which comprise this group. One of the technical sessions of the convention was held in the Physics Lecture Room of the Hewitt Building and immediately following this session a luncheon was tendered by Cooper Union to all the delegates. The Fifth Avenue Hotel was the scene of this event. The presiding officer and toastmaster at this affair was Nicholas Stefano, Chairman of the Cooper Union Branch.

To Stefano befell the honor of introducing the prominent engineers who, as senior members of the parent society, were guest speakers. The luncheon program also included the donation of prizes to the student members of the attending colleges, who delivered the best papers at the technical sessions.

Jack Drutman was the representative speaker for the Cooper Branch, and delivered a fine paper on "The Automatic Automobile." The choice of Drutman as representative of Cooper Union was the result of a competition held within our branch. It is a policy of the A.S.M.E. to present student speakers at its meeting, and from these speakers to choose the best for the convention.

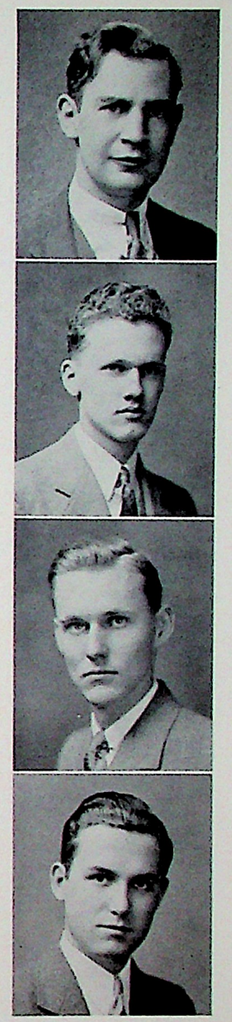
Among the papers from which Drutman's "The Automatic Automobile" was picked were Norman Korn's "Air Pollution," Max Yesowitz's "Elimination of Vibrations" and Jack Drutman's "Variable Speed Drives."

The success of the season's activities was, in a large measure, due to the efforts of Nicholas Stefano, student chairman of the group and Professor H. F. Roemmele, honorary chairman. In acknowledgment of his accomplishments, Stefano was the recipient of the biography which is the annual award to the student who has done the most for the student branch during that year.

This year's executive board includes Max Yesowitz, chairman; C. Mikulka, vice-chairman; C. Kirby, treasurer; and M. Welling, secretary.

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS

Raymond J. Kunz, Faculty Counselor



Charles Leyes
President
Gerald Varnum
Vice-president
Charles Motejzik
Secretary
Robert Umbdenstock
Treasurer

When the American Institute of Chemical Engineers was organized in 1908, there were few chemical engineers in the United States. The founders acted wisely in restricting their membership to a small group with high standards. They gained respect for the organization by their advanced code of ethics, the high quality of their professional proceedings, and their abstention from propaganda.

In 1921, the question of student chapters was presented to the Institute and after due deliberation the plan met with unanimous approval. From one chapter in 1922, the number of student branches of the Institute grew steadily until last year there were thirty-seven chapters.

This marks the eighth year of the existence of the Student Chapter of the American Institute of Chemical Engineers in The Cooper Union, the organization having been founded in 1928. Although at the outset both Day and Night students were included in the membership, in 1932 the Institute of Technology and the Night School Chemical Engineers separated, and the Day Branch of the A.I.Ch.E. was formed. The Night School Branch disbanded soon afterwards, but the Day Branch kept functioning. Interest in the organization has been steadily increasing, as evidenced by the upward trend of the attendance at the meetings.

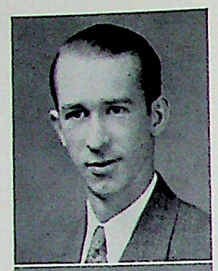
The first meeting of the year is generally used for a discussion of plans for the coming season. The usual plans call for speakers prominent in the chemical engineering profession, talks by members of the faculty, and also for several student speakers. Meetings with other local chapters of the A.I.Ch.E. are also in prospect.

The Freshman Reception held in December is one of the main events of the season which is sponsored by the Chapter. At the reception a prize is awarded to the chemical engineering student who had the best record in his freshman year. Later in the year, the entire Senior Class participates in the annual student problem contest given by the American Institute of Chemical Engineers.

It is desired that the Night School of Engineering will become sufficiently interested to re-open the former night branch of the American Institute of Chemical Engineers.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS

DAY DIVISION



Joseph Weber
President
John Scully
Vice-president
Seymour Clair
Secretary
Abraham Merlin
Treasurer

A. J. B. Fairburn, Faculty Counselor

One of the marks of a successful man is the ability to express his ideas intelligently to his fellow-men. The classroom provides ample opportunities to secure these ideas while the student branch of the engineering societies—in this case, the American Institute of Electrical Engineers—enables the students to obtain much experience in the presentation and discussion of individual viewpoints. Membership in the Institute also furnishes many openings for obtaining a broader understanding of the electrical engineering profession through field trips, talks by instructors and others prominent in their line, and motion pictures and slides of the industries. Recognizing all these factors, the administration has placed the A.I.E.E. meeting prominently in the schedule, enabling a larger percentage of students to attend than in previous years.

The meetings during the season consist chiefly of papers presented by students on related topics. Especially fine subjects were submitted by E. Golub on Musical Instruments and Electricity, L. Cardenas on Probability As Applicable to Telephone Engineering, L. Evans on Marine Electrical Propulsion, and T. W. Reynolds on Illumination Engineering. Among the more prominent student speakers were A. Merlin and G. I. Schulmann. After each talk the meeting was given over to open discussion concerning the subject.

Field trips included the Long Lines Department of the American Telephone and Telegraph Company, the large, modern Generating Plant of the New York Edison Company at Fourteenth Street and Irving Place, and the International Wireless Company's station at Rocky Point.

Among the prominent speakers invited to the meetings were Professor Scott of Yale University and Mr. W. L. Morrow, editor of "Electrical World" magazine and active engineer of note. The wide interest evidenced in their talks was indicated by the attendance of over two hundred students at each of these meetings.

Newly-appointed Assistant Professor, Ernest L. Starr, representing the faculty before members of the society, delivered a very helpful talk on various phases of electrical engineering and the chances of success in this field.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS

NIGHT DIVISION

Charles Gorman
President
Arthur Landsverk
Vice-president
William Vreeland
Secretary
Andrew Levada
Treasurer

A. J. B. Fairburn, Faculty Counselor

The Night Student Branch of the American Institute of Electrical Engineers has been in existence for two years. During this time it has fully served the purpose for which it was created.

The students of The Cooper Union Night School of Engineering have very little spare time for anything outside of regular college work. They acquire a large amount of theoretical knowledge in their courses, but they cannot supplement this by practical knowledge and discussion because of their arduous study programs. Membership in the Night Division Student Branch of the American Institute of Electrical Engineers helps the electrical engineering students to accomplish this necessary task. Through their attendance at the meetings, they are kept in close contact with new developments and practical problems in modern electrical engineering practice.

The Student Branch also affords the new graduates a means of bridging, to some extent, the gap between commencement and actual practice. The student is graduated with his mind full of technical knowledge. He is inexperienced, no matter how well he is trained. In actual practice he discovers to his surprise that many of the theories deeply ingrained in him are discarded by the engineers for various reasons. If he has been a member of the Student Branch he is prepared for this discovery because he has been shown by lectures, by moving pictures, and by field trips, much of the workings of practical electrical engineering.

A very interesting program for this year was arranged and partially completed by the new officers. Lectures by members of the faculty, reading of technical papers prepared by members of the A.I.E.E., talks illustrated with lantern slides and motion pictures by some of the most prominent electrical engineers of today, and field trips to several of the largest electrical power plants in the metropolitan area, have been the highlights of the year's activities.

The last meeting of the year was devoted to the awarding of prizes to the students who presented the best papers.

THE ANNUAL DANCE

The Annual Dance begun in 1918 as a function of the Night Engineering and Architectural Schools, has become a tradition to The Cooper Union. A customary feature of this affair has been the awarding of the Gold "C" for participation in the field of extra-curricular activities.

This year, in lieu of the fact that the Blanket Fee entitles its members to a ticket for the dance, the Annual was sponsored by the General Students' Council and was opened to all students of the four schools of The Cooper Union.

The 1936 Annual Dance, very well-attended because of the Blanket Fee, was pronounced both a social and financial success.

THE ANNUAL DANCE COMMITTEE

JOHN F. WESTMAN
General Chairman

Business Committee

ALFRED A. RATHOFER, Chairman
E. PALMER ALLEN
BERNARD SCHENKER
RAYMOND DUGUID

Entertainment Committee

EUGENE A. KELLY, Chairman
GERALD F. DALTON
GARY STANWICK
SIDNEY SWERTLOFF

THE SENIOR BALL

The origin of the Senior Ball is shrouded in mystery. No one seems to know the exact date of its beginning. All answers, when boiled down, read the same, "It was a long time ago."

The Senior Ball of 1936 added another success to the long list. The new graduates will long cherish their memories of this affair.

THE SENIOR BALL COMMITTEE

ALFRED A. RATHOFER
General Chairman

Business Committee

JOHN F. WESTMAN, Chairman
LOUIS J. SCHRAMM
GEORGE KLIGFIELD
RAYMOND DUGUID
RALPH J. BERGMAN

Entertainment Committee

MAX YESOWITZ, Chairman
NICHOLAS C. APOSTOLOU
EUGENE A. KELLY
ALEXANDER SEGALMAN
T. EDWARD THORSEN

FRATERNALISM AND ALUMNI-ISM

During college training there is little opportunity for enjoying social contacts. The work is so severe that the available time can be devoted to little else besides study.

At The Cooper Union where the fraternities were founded primarily for scholastic achievement, many opportunities are presented for companionable associations. Fraters in one class are able to study in groups with comfort and ease, and can help the lower classmen to surmount their obstacles. Thus, lasting friendships among members of different courses are born and kept alive.

After graduation, the desire to repay their Alma Mater makes the alumni band together with the express purpose of furthering the traditions and works of The Cooper Union. It is membership in the Alumni Associations whereby valuable contacts with successful men are made and treasured. The gratitude of the students must be tendered to these organizations for many of the memorials, libraries, laboratory equipments, scholarships, and study rooms existing in The Cooper Union today. These organizations have chosen an excellent manner in which to express their sincere appreciation for the training which they received at The Cooper Union. Can the new graduates formulate a better plan to show their thankfulness?

PHI SIGMA OMEGA

FRANK TRACEY
Grand Master

JOSEPH MICHAELSON
Deputy Grand Master

JAMES J. GILL
Exchequer

THOMAS TRAYNER
Recorder

In this, the ninth year of its existence, Phi Sigma Omega Fraternity is still one of the foremost in The Cooper Union.

Since 1926, the year of its founding, Phi Sigma Omega has made tremendous strides in the fostering of scholasticism and fraternalism. The fact that very few of its members have ever been obliged to leave college because of difficulties in their courses, speaks for the friendliness and helpfulness among the fraters. Where a man's studies were becoming arduous, his brothers gave willingly of their time and knowledge in order to aid him in overcoming his obstacles. This feeling of brotherliness is the backbone of Phi Sigma Omega and is the main purpose of its founding. To this idea, all other activities are secondary.

The field of extra-curricular activities has claimed many P.S.O. fraters. Because each application for membership is closely investigated, none but the best can become brothers of Phi Sigma Omega. THE CABLE, Athletic Association, Pioneer, Annual Dance, Class Officers, General Students Council, Blanket Fee Committee, and Class Affairs have all had their share of P.S.O. men.

Social activities within the fraternity itself are well supported. Two formals a year, many open-house nights, several socials, and a spring dance serve to weld the brothers into a closely bound unit. Besides these social functions of the Alpha Chapter of The Cooper Union, there are those of the Grand Lodge and the other Chapters. These also are well attended by the Alpha Fraters.

The Phi Sigma Omega fraternity house is located at 39 East Seventh Street. It is here that the brothers congregate in their "leisure" hours and enjoy the luxury of a homelike atmosphere. In their busy periods, the house is jammed with young men of serious and determined mien, intent on their studies or cramming to pass an all-important exam. But the environment is not always calm, peaceful, and quiet. Every so often, the house is the scene of a young riot as the fraters attempt to expend that pent-up energy in good clean fun.

Proud of its colorful history, the brothers, both alumni and students, have formulated many plans to further glorify both The Cooper Union and the Phi Sigma Omega Fraternity.

FRATRES IN FACULTATE

Edward A. Miller
Austin J. Purves, Jr.
Charles O. Roth, Jr.
Joseph J. Tanzola
Miles H. Van Buren

FRATRES IN COLLEGIO

Stephen Alessi
Anthony Ancona
Michael Aruck
Frederick L. Attwood
Herbert A. Bahrenburg
Stanley Berg
James Burke
Francis W. Delassalle
Frank Del Papa
Raymond B. Duguid
James J. Gill
Frederic C. Hamel
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OMEGA DELTA PHI

Alpha	Cooper Union Night Engineering School
Beta	Polytechnic Institute, Brooklyn
Gamma	School of Commerce, N. Y. University
Delta	Cooper Union Institute of Technology
Epsilon	Brooklyn College

Omega Delta Phi fraternity was founded in the year 1903 by seven Cooper students among whom was Karl Hauptmann, now a professor in the Physics Department. In the ensuing years, this, the first fraternity at Cooper, has expanded and now includes five Chapters at four different Colleges as well as an Alumni Chapter.

The chief purpose of the fraternity is the promotion of true fraternal friendship. The Chapter files, giving addresses of fratres in Rome, Germany, Russia, Mexico, Poland and Argentina, and frequent visits from old-timers and charter members attest to success in that endeavor.

It was not until 1913 that the brotherhood was incorporated under the Laws of the State of New York as Omega Delta Phi Fraternity, Inc. The Alumni Association formed in 1908, and consisting of the founder and senior members was mainly responsible for this manifestation of progress. In 1915 The Cooper Union Chapter was granted a charter as the Alpha Chapter. In 1916 a charter was granted to a group of Brooklyn Polytechnic Institute as the Beta Chapter. From 1925 to 1928 two more chapters were added; one from New York University as Gamma; the other from The Cooper Union Institute of Technology as Delta. In 1935 the latest but we hope not the last Chapter was added by the granting of a charter to a delegation of Brooklyn College students.

Each Chapter holds a monthly meeting, three or four Open-House entertainments each year and a Chapter Dance, while the entire fraternity joins in an All-Chapter Dance and an Annual Convention.

Hence, from a small group of true Cooper Union students, some of whom are now prominent members of the Faculty, a brotherhood was created, whose scope has ever increased, so that today it is outstanding and conspicuous among other similar organizations for its upstanding and noble purposes.

The members of Omega Delta Phi have always been known as men of character, respected by fellow students and Professors, have always been leaders in scholastic and extra curricular activities, and have further brought glory to their fraternity and Alma Mater by their outstanding activities in the Engineering profession.

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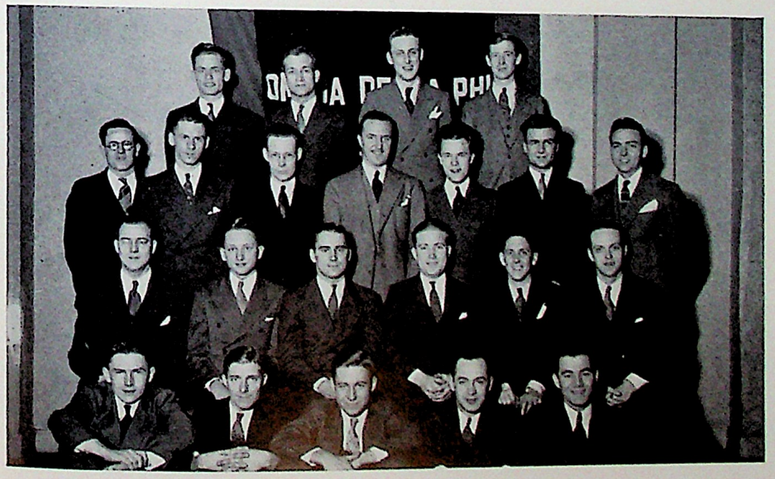

LAMBDA SIGMA KAPPA

Lambda Sigma Kappa begins its thirty-first year in Cooper Union with a program of progressive endeavor. Following tradition, the fraternity will continue to foster scholarship to go hand in hand with character and fraternalism. We are eagerly looking forward to gaining many new laurels to add to our abundant collection.

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CHAPTERS

Alpha	The Cooper Union
Beta	College of the City of New York
Gamma	Polytechnic Institute of Brooklyn
Delta	Massachusetts Institute of Technology
Epsilon	Columbia University
Zeta	New York University
Eta	Harvard University
Theta	Bellevue Medical College
Iota	Yale University
Lambda	University of Pennsylvania
Mu	University of Maryland
Nu	University of Virginia
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Pi	Long Island University
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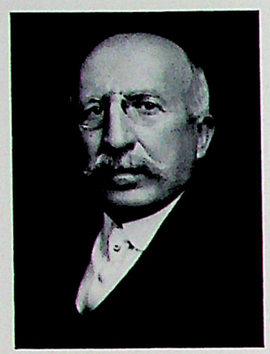

Henry D. Williams

The Cooper Union Alumni Federation is a group of delegates from each of the departmental alumni associations, and acts for them only in such matters as require unified alumni action, such as: annual "Founder's Day" celebration, decoration of the grave of Peter Cooper in Greenwood Cemetery, decoration of the monument of Peter Cooper in Cooper Square, and decoration of the bust of Peter Cooper in the Hall of Fame.

The Alumni Federation was organized about eighteen years ago after the trial of a General Alumni Association which included individual membership from all the alumni departments, and which failed because its very formation was competitive to the departmental alumni associations. The Alumni Federation remedied that condition. It is composed of ten permanent delegates, two from each of the five departments and ten annually elected delegates, two from each of the five alumni associations. The departments represented are: General Science (Mechanical and Civil Engineering); Electrical Engineering; Architecture; Chemistry; Institute of Technology.

The First President of the Federation was J. Charles Riedel, General Science '98. He was succeeded by Robert C. Coffin, Electrical Engineering '14, who in turn, was succeeded by the present President, Henry D. Williams, General Science '85. The permanent members are: General Science, J. Charles Riedel and Henry D. Williams: Electrical Engineering, Robert C. Coffin '14 and Wilfred A. Miller '08; Architecture, Edward A. Miller '74 and William H. Wagner '03; Chemistry, Alfred Hilbert '01 and Christian Weaver '03; Institute of Technology, George F. Bateman '07 and Charles F. Giraud '08.

The present officers in addition to the President are Edward A. Miller, First Vice-president; William H. Wagner, Second Vice-president; Alfred Hilbert, Secretary and Treasurer.

It will be noted that a member of the Faculty, Dean Bateman, is a permanent member of the Federation, enabling the Federation to keep in touch with faculty and student activities.

The Alumni Federation has no other income than what is derived from the alumni associations in the form of proportionate assessments toward the Alumni Federation budget.

Therefore, the effectiveness of the present set-up depends on the active functioning of all the departmental alumni associations, so it still rests with each and every individual alumnus to awaken to a feeling of gratitude to the institution which so unstintingly provided the means of gaining an education and to show that gratitude by supporting their departmental alumni associations, both financially and physically.

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Philip S. Anthes

The Architectural Chapter of the Cooper Union Alumni has had an extremely busy year this season. The officers chosen in the early part of the year were: Philip S. Anthes, President (third consecutive term); Thomas B. Dickinson, Vice-president; Lester J. Davis, Secretary; and Bertram J. Bertolamy, Treasurer. A few months later, Mr. Davis, because of the pressure of outside business, was forced to resign his position. Mr. J. Dalis '31 was elected unanimously to succeed Mr. Davis in the office of Secretary.

Some of the doings of the Chapter this year are as follows: Two joyous socials for the members of the Chapter only; the gay gathering at the Founders Day Dinner, February 12, 1936; the lecture-tour to the Metropolitan Museum of Art. The members attending these affairs all declare that they had a very enjoyable time.

A new method of awarding the Architectural Alumni medal was adopted this year. It is the intention of the Chapter to select one group of graduates for the purpose of judging the class work of the Seniors during the year and another group to check the extra-curricular activities of the graduating class since their entrance into The Cooper Union. Only men who have been very active in scholastic and extra-curricular work during their courses are eligible for this award.

The program for the remainder of the year as composed thus far includes: Volunteer speakers chosen from the members of the Chapter to give discourses on specific subjects relating to the study of architecture; a stag get-together, and several lecture-tours through some of the large buildings, museums, and civic structures located in and around New York City.

The new chairmen of the committees chosen for this year are as follows: J. DeMarco '32, in charge of Program; A. Pavia '33, Membership; B. Bertolamy '31, Entertainment; W. Wagner '03, Delinquent; A. Kirschenbaum '33, Lecture-Tours; J. Fitzgerald '33, Financial.

The officers and members of this Chapter take this opportunity to wish all old graduates and the new 1936 graduates of the Architectural Course lots of success, with the hope that we shall hear from them in the near future.

GENERAL SCIENCE

Charles Jellinek
President

Henry Williams
1st Vice-president

Samuel Ochs
2nd Vice-president

Alfred Rader
3rd Vice-president

The General Science Alumni Association is the oldest graduate organization of The Cooper Union. It has its origin in 1877, thirteen years after the first class of five men were graduated from the Scientific Course in 1864. From among these classes, the first Cooper Union Alumni Association was formed. Prompted by a desire to carry on the work begun by Peter Cooper, they aimed to create an organization that would take upon itself the privilege and duty of keeping alive the honored traditions of The Cooper Union.

The organization grew under the name of The Cooper Union Alumni Association into a large, closely united group. Under its auspices annual dinners were held on Founder's Day and monthly meetings were conducted during the school year. The Association even established its own library.

Despite numerous setbacks, the organization continued to flourish as the result of concerted effort of a few men truly interested in the welfare of The Cooper Union. It is to these men: Henry Kaltenbach, William P. Hennessy, Henry D. Williams, Charles H. Dilg, Sergis F. Sammarco, Irving H. Fisher, William S. Bondy, and H. J. Laber, and to their efforts that the Association owes its continued existence.

The General Science Alumni Association now has a nominal membership of fifteen hundred. Regular meetings are held in November, January and April, at which addresses of scientific interest are presented. Visits are made to various projects of industrial, educational, and engineering interest. These addresses and tours are well-attended by the members who feel certain that their officers are bending all their efforts to arrange both profitable and enjoyable programs.

In June, 1921, a smoker was given to the class of 1921 and, since then, this annual custom has continued either as a Smoker, Dinner Dance, or Buffet Supper and Reception. These social affairs help to cause a renewal of interest in the Association and it is hoped that with the continued infusion of the newer graduates, these functions will attract an ever-increasing attendance.

The Association has been a regular contributor to the "Alumni and Associates Fund." It has also made donations for scholastic prizes and for books and drawing instruments to be loaned to needy students. In its most recent efforts

ALUMNI ASSOCIATION

the organization has initiated the plan to secure gymnasium and swimming pool facilities for the students. This movement was carried out under the sponsorship of the Alumni Federation and the use of the Christadora House was obtained. The General Science Alumni also donated the nucleus of the fund for the bust of Peter Cooper in the Hall of Fame, completely fitted and furnished the Students and Graduates Room, and contributed the framework and foundation for the bas-relief of Peter Cooper by Augustus St. Gaudens, located in the Main Hall of the Foundation Building. Alumni members have also made individual contributions in the form of monetary gifts, endowments, scholarships, libraries and laboratory apparatus.

The carrying out of the purposes of the Association, as outlined in Article II of the constitution which follows is an ideal sufficiently broad to stimulate the enthusiasm of all men worthy to be called the sons of The Cooper Union:

First—To unite the graduates of the General Science of The Cooper Union in the bonds of fellowship.

Second—To encourage scientific inquiry and promote interchange of information in the Arts and Sciences.

Third—To cooperate with the Board of Trustees and the various Alumni and Student Organizations in achieving the ideals of our Founder.

Fourth—To encourage the philanthropic doctrines of The Cooper Union.

Conforming to this outline, the Association has, at the time of the writing of this article, a movement under way to unite all the individual Alumni Associations of the different schools comprising The Cooper Union. The essence of this plan is to have one Alumni Association, with a chapter for each department of the school and each fraternity. It is hoped that through this movement, more men will find an interesting as well as beneficial means of continuing the friendships cultivated during the years at Cooper Union.

In spite of how little or how much the Association has accomplished, it could accomplish more if the graduates of The Cooper Union, and those who will soon be graduates, **give to it** even a small proportion of the energy that they display in **obtaining from** The Cooper Union all the benefits that they can.

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The Cooper Union Chemical Society was organized in 1894 for the purpose of promoting good fellowship and scientific discussion among the alumni and seniors of the Chemical and Chemical Engineering Courses.

To carry out these purposes, the Society holds an Annual Dinner in January and combination smoker and business meetings in May and November. Lecture meetings are conducted monthly during the college year at which men, expert in some particular field, talk about their specialized phase of the chemical industry and answer any questions asked by the audience.

This year the following lectures were delivered:

Prof. Christian Weaver	Chemistry of Malting
Prof. Christian Weaver	Chemistry of Brewing
Colonel Gibson . . .	Chemical Warfare: Past, Present, and Future
Prevost Hubbard	Paving the Bed of the Mississippi River
Dr. E. A. Saul	Cellular Enzymes and Cellular Respiration
Julian Reasenberg . . .	Production of Light by Chemical Reaction

The Society awards prizes annually to the best students in chemistry as selected by the faculty. It also confers a Medal of Honor for outstanding work in the field of chemistry. This medal is awarded only at rare intervals.

In addition to its activities with chemists and chemical engineers, the Society cooperates with the other Alumni Societies through the medium of the Alumni Federation of The Cooper Union.

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We wish to express our sincere gratitude to the following members of the faculty, instructing staffs, alumni, and administration of The Cooper Union, who have graciously patronized the 1936 issue of the CABLE:

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We of the 1936 CABLE are indebted to the following persons for their immeasurable assistance to us in the production of this volume. Without their willing cooperation and helpful suggestions, the work entailed in producing this, the fourteenth edition of the CABLE, would have been insurmountable.

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It has been a real pleasure to work on the 1936 CABLE. We are particularly grateful to Charles Alan Hauck, Editor-in-Chief, and Philip Edwin Hagerty, Managing Editor, for their conscientiousness, their cooperation, and their intelligent understanding of the printer's problems.

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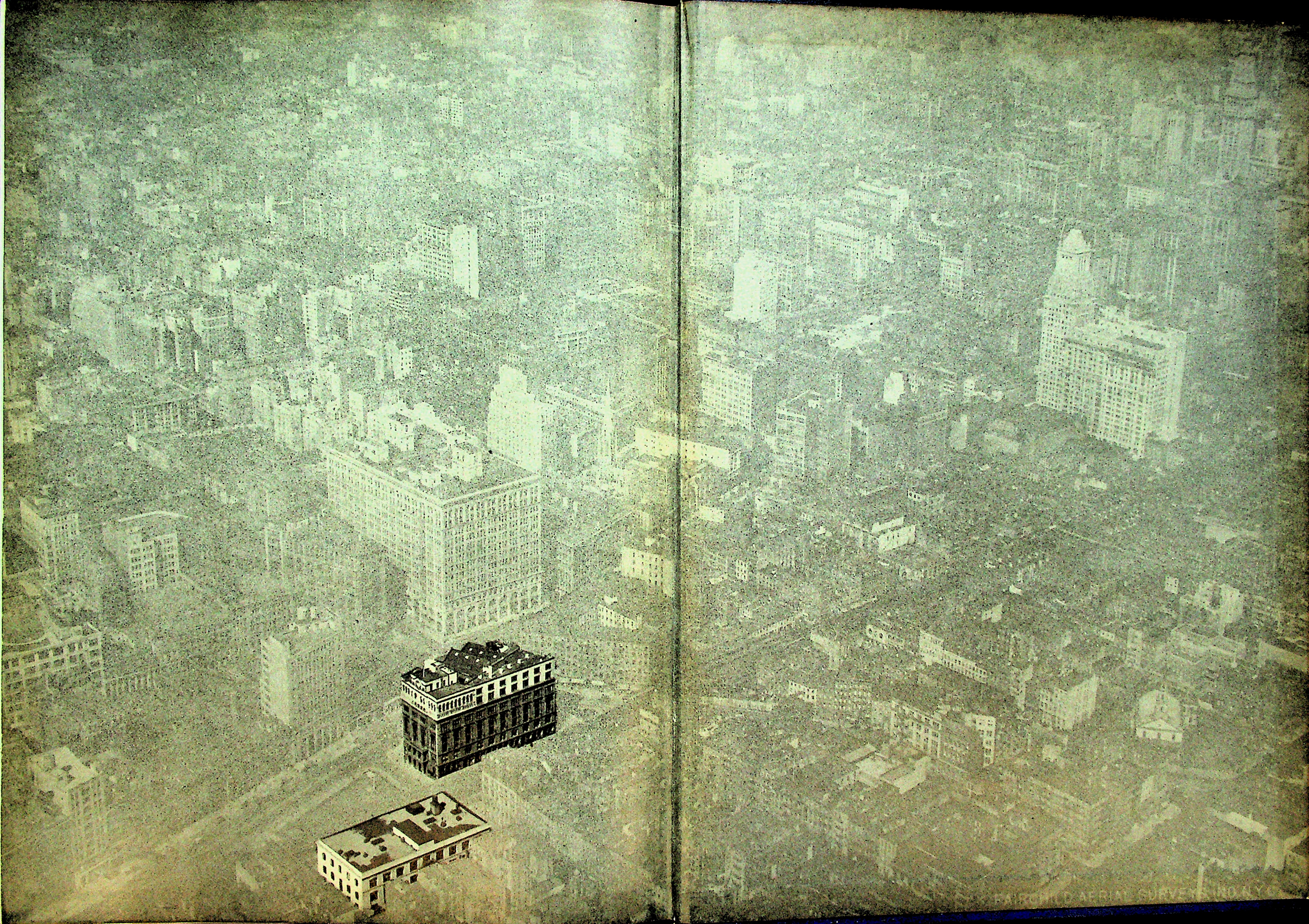
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